APPENDIX K

ADDITIONAL EVIDENCE

SAN ANTONIO EAC REGION ATTAINMENT DEMONSTRATION

MARCH 2004

Appendix K

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Alternative Fuel Survey

Introduction

A local alternative fuel survey has been conducted in 2001by staff of AACOG, which inventoried the AFV fleet in the SA MSA. The survey provided information on the number of AFVs, specific fuel type, the percentage of time that they operate on alternative fuel, the number of days per week they typically operate, and an estimate on how many vehicle miles traveled (VMT) were accumulated by each vehicle for 2001.

The results indicated that there were 2,050 AFVs in the San Antonio region, and this number is expected to increase to 2,442 AFVs by 2006. The survey results were used to assess the effectiveness of both the current AFV fleet, and the 2007 AFV fleet, at reducing ozone precursor emissions. AFVs reporting a 0% usage rate of alternative fuels taken out, there were 1,755 vehicles modeled for the September 2001 fleet, and 2,147 vehicles modeled for the September 2007 fleet that use alternative fuel.

Analysis of operation of the 2001 AFV fleet indicates that this fleet is generating emissions reductions of 62 lbs./day of VOC, 45 lbs./day of CO, and 689 lbs./day of NOx, and it is projected that this fleet could contribute emissions reductions of 72 lbs./day of VOCs, 45 lbs./day of CO, and 858 lbs./day of NOx for the year 2007.

While these estimated reductions are not overly sizeable, they do illustrate that a switch to alternative fuel vehicles will result in the reduction of ozone precursors in addition to reducing our nation's dependence on foreign oil. As alternative fuel technology advances, refueling infrastructure expands, and the use of alternative fuels becomes more acceptable, the emissions reductions resulting from the utilization of an AFV fleet in the SA MSA should become more significant.

The following pages reproduce the survey materials distributed in 2001.
The survey information is followed by the results.

2001 Alternative Fuel Survey

Alternative Fuel Work Schedule Survey

COMPANY or ORGANIZATION

FUEL - How much of each alternative fuel, in gasoline gallon equivalents (gge), did your fleet consume in 2001?

Natural Gas	0
Propane	0
Ethanol	0
Methanol	0
Biodiesel	0
Electricity	0

Fuel Stations

Please update the number of vehicle alternative fuel refueling stations you operate on the following page. Please make sure that your station numbers add up (that the number of stations for 2001 equals the number of 2000 stations, plus the number added in 2001, minus stations closed in 2001.) In addition, please forecast the number you plan to have in operation in the year 2006.

Public - A public refueling site is available for use by the general public, either by accepting cash/credit payment, by prior arrangement, or by use of a refueling card.

Private - A private refueling site is not available for use by the general public.

Alternative Fuel Refueling Stations

Customer Availability (Public or Private)		Fuel Type	2000 Total	Added in 2001	Closed in 2001	2001 Total	Planned for 2006
Public	Private						
0	0	CNG	0	0	0	0	0
0	0	LNG	0	0	0	0	0
0	0	Propane	0	0	0	0	0
0	0	Ethanol	0	0	0	0	0
0	0	Electric	0	0	0	0	0
0	0	Biodiesel	0	0	0	0	0
0	0	Methanol	0	0	0	0	0
0	0	Other: _____	0	0	0	0	0
Total			0	0	0	0	0

VEHICLES – Please update the number of alternative fuel vehicles in your fleet on the following page. Please make sure that your vehicle numbers add up (that the number of vehicles for 2001 equals the number of 2000 vehicles, plus the number added in 2001, minus vehicles retired in 2001).
Alternative Fueled Vehicles

Vehicle Class	Vehicle Type (Car, Truck, Bus, etc.)	Fuel Type	2000 Vehicle Total	Vehicles Added in 2001	AFVs Retired in 2001	2001 Reported Total	Planned For 2006	Estimated Vehicle Miles Traveled Per Year for each Vehicle
LIGHT DUTY		CNG	0	0	0	0	0	0
		LNG	0	0	0	0	0	0
		Propane	0	0	0	0	0	0
		Ethanol	0	0	0	0	0	0
		Electric	0	0	0	0	0	0
		Biodiesel	0	0	0	0	0	0
		Methanol	0	0	0	0	0	0
		Other: _____	0	0	0	0	0	0
		Light-duty Subtotal	0	0	0	0	0	0

Alternative Fueled Vehicles (Cont.)

Vehicle Class	Vehicle Type (Car, Truck, Bus, etc.)	Fuel Type	2000 Vehicle Total	Vehicles Added in 2001	AFVs Retired in 2001	2001 Reported Total	Planned For 2006	Estimated Vehicle Miles Traveled Per Year for each Vehicle
Heavy Duty		CNG	0	0	0	0	0	0
		LNG	0	0	0	0	0	0
		Propane	0	0	0	0	0	0
		Ethanol	0	0	0	0	0	0
		Electric	0	0	0	0	0	0
		Biodiesel	0	0	0	0	0	0
		Methanol	0	0	0	0	0	0
		Other: _____	0	0	0	0	0	0
		Heavy-Duty Subtotal	0	0	0	0	0	0
Grand Total			0	0	0	0	0	0

2001 Alternative Fuel Survey Results

The results of the 2001 Alternative Fuel Survey can be found in the following tables. Averages and defaults used in the modeling are denoted in bold.

Table K-1. Light Duty Vehicles Operating on CNG

Vehicle Class	Organization	2001 Total	% as AFV	Days/ Week	VMT	2006 Projected Increase
LDT	12 TS Randolph	50	0%	0	5562	
LDT	37 TS Lackland	118	0%	0	10,000	
LDT	BexarMet Water	34	90%	5	10,000	
LDT	CPS	2	100%	4	5 to 10,000	
LDT	SA Parks	22	100%	7	10,000	
LDT	TxDOT	46	90%	5	10,000	
LDT	USPS	4	0%	0	10,000	
LDT	UTSA	15	45%	5	5,486	
LDT	Yanaguana Cruise	40	100%	7	10,000	
	Total LDT CNG	331				

Table K-2. Light Duty Vehicles Operating on Propane

Vehicle Class	Organization	2001 Total	% as AFV	Days/ Week	VMT	2006 Projected Increase
LDT	AmeriGas	7	100%	5	10,000	
LDT	Beldon Roofing	74	86%	5	10,000	
LDT	Bell Hydrogas	16	100%	5	10,000	
LDT	Bexar County	60	50%	5	3795	25
LDT	BexarMET Water	6	86%	5	10,000	
LDT	City of San Antonio	37	50%	5	13,514	
LDT	City of San Antonio	198	100%	5	13,514	55
LDT	Mission Gas	14	100%	5	10,000	
LDT	Northside ISD	8	100%	5	10,000	
LDT	SA Inter. Airport	20	100%	5	10,000	
LDT	San Antonio Water System	43	14%	5	10,000	
LDT	SA Trans	18	100%	7	10,000	
LDT	Schwan's Enterprise	25	100%	5	10,000	
LDT	Texas State Hospital	52	86%	5	10,000	
LDT	Thad Ziegler Glass	37	86%	5	10,000	23
LDT	TxDOT	188	86%	5	10,000	172
LDT	US Park Service	1	86%	5	10,000	
LDT	UTSA	2	50%	5	16,602	
LDT	VIA Transit	184	100%	6	32,019	
	Total LDV Propane	990				

Table K-3. Light Duty Vehicles Operating on Ethanol

Vehicle Class	Organization	2001 Total	% as AFV	Days/ Week	VMT	2006 Projected Increase
LDT	12 TS Randolph	1	0%	0	5,562	
LDT	CPS	21	0%	0	14,000	
LDT	USAA	100	0%	0	10,000	
LDT	USPS	1	0%	0	10,000	
	Total Ethanol	123				

Table K-4. Light Duty Vehicles Operating on Electricity

Vehicle Class	Organization	2001 Total	% as AFV	Days/ Week	VMT	2006 Projected Increase
LDT	37th TS Lackland	2	100	5	10,000	
LDT	USAA	21	100	5	10,000	
LDT	UTSA	26	100	5	2,080	
	Total Electric	49				

Table K-5. Heavy Duty Vehicles Operating on LNG

Vehicle Class	Organization	2001 Total	% as AFV	Days/ Week	VMT	2006 Projected Increase
	Total LNG	0				

Table K-6: Heavy Duty Vehicles Operating on Propane

Vehicle Class	Organization	2001 Total	% as AFV	Days/ Week	VMT	2006 Projected Increase
HDT	VIA Transit	66	100%	7	34,295	37
HDT	City of San Antonio	51	100%	5	9,551	
	Total HDV Propane	117				

Table K-7. Heavy Duty School Buses Operating on Propane

Vehicle Class	Organization	2001 Total	% as AFV	Days/ Week	VMT	2006 Projected Increase
HDT	NISD	440	100%	5	14,000	80
	Total	440				

Additional respondents to the survey included the Schertz-Cibolo-Universal City Independent School District and the City of Floresville. Both reported that they did not currently operate any AFVs.

These survey responses were analyzed through the use of the AirCRED model. Prior to the use of the AirCRED model, the survey results were first grouped together based on the percentage of time the vehicle operated on alternative fuels, and the number of days per week the vehicle typically operated. This was a necessary component of the modeling process since not all of the vehicles operated the same percentage of time on alternative fuels, or the same number of days per week, and these two fleet characteristics are required model inputs. For these reasons, the survey responses were categorized into nine groups as illustrated in the following pages.

Table K-8. Group 1 – 100%, 7 Days Per Week

Group 1	Vehicles that operate 100% of the time on AFs, 7 days per week								
Vehicle Class	Fuel	Organization	Total	VMT	% as AFV	Days/Week	Total VMT	Avg. VMT/ Yr	Avg. Daily VMT
LDT	CNG	SA Parks	22	10000	100	7	220000		
LDT	CNG	Yanaguana	40	10000	100	7	400000		
			62				620000	10000	27
LDT	Propane	Satrans	18	10000	100	7	180000	10000	27
HDT	Propane	VIA Transit	66	34295	100	7	2263470	34295	94

Table K-9. Group 2 – 100%, 6 Days Per Week

Group 2	Vehicles that operate 100% of the time on AFs, 6 days per week								
Vehicle Class	Fuel	Organization	Total	VMT	% as AFV	Days/Week	Total VMT	Avg. VMT/ Yr	Avg. Daily VMT
LDT	Propane	VIA Transit	184	32,019	100	6	5891496	32019	103

Table K-10. Group 3 – 100%, 5 Days Per Week

Group 3	Vehicles that operate 100% of the time on AFs, 5 days per week								
Vehicle Class	Fuel	Organization	Total	VMT	% as AFV	Days/Week	Total VMT	Avg. VMT/ Yr	Avg. Daily VMT
LDT	Propane	AmeriGas	7	10000	100	5	70000		
LDT	Propane	Bell Hydrogas	16	10000	100	5	160000		
LDT	Propane	COSA	198	13514	100	5	2675772		
LDT	Propane	Mission Gas	14	10000	100	5	140000		
LDT	Propane	NISD	8	10000	100	5	80000		
LDT	Propane	SA Int. Airport	20	10000	100	5	200000		
LDT	Propane	Schwan's Ent.	25	10000	100	5	250000		
			280				3575772	12415.9	48
LDT	Electric	37 TS Lackland	2	10000	100	5	20000		
LDT	Electric	USAA	21	10000	100	5	210000		
LDT	Electric	UTSA	26	80	100	5	2080		
			49				232080	4736.33	18
HDT	Propane	COSA	51	9551	100	5	487101	9551	37
School Bus	Propane	NISD	440	14000	100	5	6160000	14000	54

Table K-11. Group 4 – 100%, 4 Days Per Week

Group 4	Vehicles that operate 100% of the time on AFs, 4 days per week								
Vehicle Class	Fuel	Organization	Total	VMT	% as AFV	Days/Week	Total VMT	Avg. VMT/ Yr	Avg. Daily VMT
LDT	CNG	CPS	2	5000	100	4	10000	5000	24

Table K-12. Group 5 – 90%, 5 Days Per Week

Group 5	Vehicles that operate 90% of the time on AFs, 5 days per week								
Vehicle Class	Fuel	Organization	Total	VMT	% as AFV	Days/Week	Total VMT	Avg. VMT/ Yr	Avg. Daily VMT
LDT	CNG	BexarMet Water	34	10000	90	5	340000		
LDT	CNG	TxDOT	46	10000	90	5	460000		
		Total	80				800000	10000	38

Table K-13. Group 6 – 86%, 5 Days Per Week

Group 6	Vehicles that operate 86% of the time on AFs, 5 days per week								
Vehicle Class	Fuel	Organization	Total	VMT	% as AFV	Days/Week	Total VMT	Avg. VMT/ Yr	Avg. Daily VMT
LDT	Propane	Beldon Roofing	74	10000	86	5	740000		
LDT	Propane	BexarMet Water	6	10000	86	5	60000		
LDT	Propane	Texas State Hosp.	52	10000	86	5	520000		
LDT	Propane	Thad Ziegler Glass	37	10000	86	5	370000		
LDT	Propane	TxDOT	188	10000	86	5	1880000		
LDT	Propane	US Park Service	1	10000	86	5	10000		
Total			358				3580000	10000	38

Table K-14. Group 7 – 50%, 5 Days Per Week

Group 7	Vehicles that operate 50% of the time on AFs, 5 days per week								
Vehicle Class	Fuel	Organization	Total	VMT	% as AFV	Days/Week	Total VMT	Avg. VMT/ Yr	Avg. Daily VMT
LDT	Propane	Bexar County	60	3795	50	5	227700		
LDT	Propane	COSA	37	13,514	50	5	500018		
LDT	Propane	UTSA	2	16,602	50	5	33204		
Total			99				760922	7686.08	30

Table K-15. Group 8 – 45%, 5 Days Per Week

Group 8	Vehicles that operate 45% of the time on AFs, 5 days per week								
Vehicle Class	Fuel	Organization	Total	VMT	% as AFV	Days/Week	Total VMT	Avg. VMT/ Yr	Avg. Daily VMT
LDT	CNG	UTSA	15	5486	45	5	82290	5486	21

Table K-16: Group 9 – 14%, 5 Days Per Week

Group 9	Vehicles that operate 14% of the time on AFs, 5 days per week								
Vehicle Class	Fuel	Organization	Total	VMT	% as AFV	Days/Week	Total VMT	Avg. VMT/ Yr	Avg. Daily VMT
LDT	Propane	SAWS	43	10,000	14	5	430000	10000	38

Table K-17. 1999 AFV Participation and 2007 AFV Participation Projections for the San Antonio Metropolitan Area

Summer	1999 Total Participation	2007 Total Participation
LDT CNG	159	159
LDT Propane	982	1257
LDT Ethanol	0	0
LDT Electric	49	49
HDT LNG	0	0
HDT Propane	117	154
School Buses	0	0
Total	1307	1619
Fall	1999 Total Participation	2007 Total Participation
LDT CNG	159	159
LDT Propane	990	1265
LDT Ethanol	0	0
LDT Electric	49	49
HDT LNG	0	0
HDT Propane	117	154
School Buses	440	520
Total	1755	2147

Table K-18. Anticipated 2007 VOC & NOx Emission Reduction Estimates (lbs/Day)

Category	All AFVs 1999		All AFVs 2007	
	VOC	NOx	VOC	NOx
Summer Peak Hour Reduction	62.37	165.61	72.04	240.75
Fall Peak Hour Reduction	62.75	689.4	72.09	859.80

AFV Emission Reduction Methodology

The alternative fuels considered in this study were liquefied petroleum gas (LPG), compressed natural gas (CNG), liquefied natural gas (LNG), biodiesel, methanol, ethanol, and electricity.

The first step in the analysis process was to determine what alternative fuel types are being used in the San Antonio region. A questionnaire was distributed to both public and private entities seeking information on how many AFVs are in operation, what types of fuel they are using, and how many vehicle miles traveled (VMT) were accumulated by using each vehicle throughout the year. In addition, a separate telephone survey was conducted to gather information on the percentage of time the vehicles were operating on alternative fuels, and the number of days per week these vehicles were in use. The results were supplemented by information gathered from the 2000 Alternative Fuel Survey and the 2001 Clean Cities Report for organizations that did not respond to the 2001 Alternative Fuel Survey.

The combined results indicated that there are currently 2,050 AFVs in the San Antonio region, and this number is expected to increase to 2,442 AFVs by 2006. The AFVs operating solely on conventional gasoline were not included in the subsequent analysis, bringing the total number of vehicles modeled in the 2001 analysis down to 1,755 vehicles, and the vehicles modeled in the 2007 analysis down to 2,147 vehicles. In addition, the 448 current, and 528 proposed propane vehicles operated by the Northside Independent School District were included in the September analysis based on the September 1999 photochemical modeling episode.

Once the results of the alternative fuel survey were compiled, the estimated emission reductions resulting from the utilization of these vehicles were calculated. Since there were no reported uses of biodiesel, methanol, or ethanol, the AirCRED model was utilized to calculate the estimated emission reductions for the entire AFV fleet. This model, developed by Argonne National Laboratory to assist the Department of Energy's (DOE's) Clean Cities coalitions, estimates the ozone precursor emissions reduction credits earned through the use of alternative fueled vehicles. The version of AirCRED that was used in this study is version 3.15, which was updated on August 1, 2001. The model is written in VisualBASIC for Microsoft Windows and consists of a series of screens, or forms, allowing for the input of data in a user-friendly manner.

The required inputs for the AirCRED model include the Clean City to be modeled, the number of AFVs, the daily VMT by the AFVs, the weekly days of operation of the AFVs, and the percentage of time the vehicles operate as an AFV. These inputs were obtained from the survey results. In the absence of survey data related to vehicle miles traveled (VMT), default VMT taken from the Dallas Fort Worth State Implementation Plan (SIP) were used. These VMT defaults are 36,000 miles/year for buses, and 10,000 miles/year for other vehicles. (TCEQ, 2000) A weighted average was calculated for the percentage of operation as an AFV, and a default of five days per week for the days per week of operation were used in the event that a response did not provide these values for a particular organization. An example of the weighted average calculation for light-duty CNG fueled vehicles is provided below.

The survey results indicated that 64 of the reported CNG vehicles were operating 100% of the time on CNG, and 15 CNG vehicles were operating 45% of the time on CNG. The weighted average was calculated to be 90% for CNG vehicles through the use of the following formula and subsequent calculation:

$$\frac{(\text{\# of AFVs} \times \text{\% of operation as AFV}) + (\text{\# of AFVs} \times \text{\% of operation as AFV})}{\text{Total number of vehicles}}$$

$(64 \times 100\%) + (15 \times 45\%) / (64+15)$ = a weighted average of 89.6 or 90%

Once the required inputs were obtained or calculated, the last step in the process prior to actually running the model was to allocate the survey results, or the AFVs, into groups based on the percentage of time the vehicles operated on alternative fuels, and the number of days per week the vehicles typically operated. This was a necessary component of the modeling process since not all of the vehicles operated the same percentage of time on alternative fuels, or the same number of days per week, and these

two fleet characteristics are required model inputs. For these reasons, the survey responses were categorized into 9 groups shown in the previous pages.

Having obtained the necessary inputs and broken the survey responses into similar categories, the AirCRED model was utilized to estimate the emission reductions resulting from the San Antonio MSA AFV fleet. The resulting emission reductions from each of the 9 groups were summed to obtain an emission reduction estimate for the entire fleet.

For the projected 2007 fleet it was assumed that the current fleet sizes were maintained at the current level unless otherwise noted. In addition, any projected increases in fleet sizes for 2006, were assumed to carry over into 2007. There were 2,147 vehicles modeled in the Sept. 2007 analysis. This represents a 22 percent increase in the AFV fleet size from 2001. The 2007 results are very similar to the 2001 results. In fact, the expected reduction in CO emissions is the same for both fleets. This is primarily due to the fact that all of the 392 additional AF vehicles are fueled by propane. The increase in the expected NOx reductions is a result of the 117 additional heavy-duty propane vehicles. Again, the projected 2007 AFV fleet size makes up only a very small percentage of all of the on-road vehicles within the region. If the AFV fleet size were to increase significantly, sizeable emission reductions should result.

The survey results were utilized in this section to assess the effectiveness of both the current AFV fleet, and the projected AFV fleet for 2007, at reducing ozone precursor emissions. With the AFVs reporting a 0% usage rate of alternative fuels taken out, there were 1,755 vehicles modeled for the September 2001 fleet, and 2,147 vehicles modeled for the September 2007 fleet that use alternative fuel.

The analysis of the SA MSA 2001 AFV fleet indicates that operation of this fleet help to reduce emission of VOC by a 62 lbs/day and a 689 lbs/day reduction in NOx emissions. The projected 2007 AFV fleet for the SA MSA indicates a 72 lbs/day reduction in VOC emissions and an 858 lbs/day reduction in NOx emissions.

While these estimated reductions are not overly sizeable, they do illustrate that a switch to alternative fuel vehicles will result in the reduction of ozone precursors in addition to reducing our nation’s dependence on foreign oil. As alternative fuel technology advances, refueling infrastructure expands, and the use of alternative fuels becomes more acceptable, the emissions reductions resulting from the utilization of an AFV fleet in the SA MSA should become more significant.

Transportation Demand Management

Introduction

TDMs are transportation projects and related activities that are designed to achieve on-road mobile source emission reductions and are included as control measures in the SIP. These measures target the users (demand) of transportation facilities (supply) rather than the facilities.

Successful implementation of TDMs can contribute to the reduction in frequency of traffic congestion, and by smoothing the traffic flow they can particularly reduce emission of VOCs, which occur at lower traveling speed.

The following pages contain materials that AACOG staff has used for conducting a local survey on use of TDMs, and at the end the overall impacts of TDMs on reduction of ozone precursors are discussed.

Cover Letter & Alternative Work Schedule Survey Questionnaire

December x, 2001

Dear <<Name>>:

The Alamo Area Council of Governments (AACOG) requests your assistance in our air quality work. AACOG is currently examining the effectiveness of reducing air pollution by allowing alternate work schedules, and we'd like to include information about your organization in our study.

AACOG will calculate the effectiveness of such initiatives by using information gathered from the entire San Antonio area. The purpose of this survey is to provide better information and services to the region, as well as to help minimize additional regulations on the community.

Your input is vital to this process and will allow AACOG to estimate the reduction of air pollution based on recent changes in business practices within office personnel. Please provide your responses on the attached survey and return it to us in the self-addressed envelope by the date indicated.

Thank you for your time and participation. If you have any questions or comments please feel free to contact Chris Langston at (210) 362-5270.

Regionally yours,

Al J. Notzon III
Executive Director
Enclosures (2)

AACOG
Alamo Area Council Of Governments

Alternative Work Schedule Survey

Organization:_____
Contact:_____
Contact Phone Number:_____

The purpose of this survey is to collect information on the use of alternative work schedules by office personnel in organizations in the San Antonio Metropolitan Statistical Area. The following lines inquire on alternate work programs your company may/may not participate in. Please respond by January 30, 2002.

Alternate Work Schedule Programs

1) Does your organization participate in any type of alternate work schedule program?

Yes ☐ No ☐

2) If so, identify the type of alternate work schedule program your organization participates in and how many employees are involved in such programs.

- ☐ Compressed Week - 9 work days for a two work weeks # of Employees _____
- ☐ Compressed Week – 4 work days for one work week # of Employees _____
- ☐ Staggered Hours – vary start and end time (ex. 9-6, 12-8) # of Employees _____
- ☐ Flex-Time # of Employees _____
- ☐ Telecommuting – performs work at home # of Employees _____

  If so, estimate average number of days worked at home. _____

3) Does your organization plan to expand any current alternate work schedule plans in the future?

Yes ☐ No ☐

4) How many more employees do you anticipate to participate in the future and in which program?

_____

_____

_____

Thank you.

2001 TDM Statistics on Survey Respondents

Table K-19. Current Employee Participation Per Program

Company	Cww9	Cww4	Staggered Hrs	Flex Time	Telecommuting
Big Red / 7-Up Bottling Co.	17.5		65		
City of Hill Country Village		10			
City of Leon Valley **	19		15		
Dean Word Co. Ltd.			90		
Goodwill Industries			5		
Health South RIOSA *	4				
Mission Road Development Center			72	5	2
Oberthur Gaming Tech.			12		
Randolph-Brooks Federal Credit Union			25		
San Antonio - Bexar County MPO			7		
San Antonio Express-News		25			12
San Antonio Federal Credit Union**	13				
Science Applications International Corp (SAIC)			25		6
State Bank & Trust of Seguin, Texas			10		
Town of Hollywood Park			1		
WellMed at Greenway Park	7		5		1
City of China Grove				2	
Marion ISD		25			
City of Castle Hills		2			
LeadingEdge Personnel			5		
VIA Metropolitan Transit Authority		48	1416	258	
John B. Sanfilippo & Son			285		
YMCA of San Antonio & the Hill Country			650		
Comal ISD (Summer Only)		800			
Northside ISD			9500		
Texas Department of Human Services	300	200	100		
Southwest Texas State University				7	7.5
Education Service Center, Region 20			75		
Harlandale ISD				20	
Southside ISD (Summer Only)		60			
Focus Direct, Inc.		32	52	7	
Wallace L. Boldt, General Construction, Inc.			20		
Southwest Mental Health Center				10	
Our Lady of the Lake University (Summer Only)		350			
VNA & Hospice			7.5		1
Sterling Metal Products			6		
Harlandale ISD (Maintenance Department)			200	200	
LaVernia ISD (Summer Only)		23	0	0	
Schertz-Cibolo-Universal City ISD		10	10		
Tobin International Ltd.	94	20		24	2
San Antonio Housing Authority		1	21	13	1

Company	Cww9	Cww4	Staggered Hrs	Flex Time	Telecommuting
Valero Energy Corporation	1127				
Bexar County	42	42	210	210	42
San Antonio Missions National Historical Park		2	52		
37 SPTG, Lackland Air Force Base			4000	2500	
City of Alamo Heights				4.5	
Guadalupe Valley Hospital		10		2	6
Randolph Air Force Base	219	5		406	
Southwest Independent School District			829		
Audie L. Murphy Veterans Administration	117	50	885		1
San Antonio Police Department		225			
U.S.A.A.		6940			727
Dee Howard Aircraft Maintenance, L.P.			298		
San Antonio Independent School District		8	74		
U.S. Army Garrison, FSH, TX.	1250	275		600	
Standard Aero (San Antonio), Inc			476		
Zachry Construction Corporation		20		20	15
Morningside Ministries					3.5
Texas Department of Transportation		21		248	
311 Human Systems Wing-Brooks AFB, TX	1				
Total Employee Participation per Program	3210.5	9204.0	19503.5	4536.5	827.0
Total EmployeeParticipation	37281.5				
Total Companies not Participating in a Program	61				
Total Companies Participating in a Program	60				
*Compressed Work Week 12					
**Compressed Work Week 4 ½					

Table K-20. Future Increase in Employee Participation Per Program

Company	Cww9	Cww4	Staggered Hrs.	Flex-Time	Telecommuting
Big Red / 7-Up Bottling Co.					
City of Hill Country Village					
City of Leon Valley					
Dean Word Co. Ltd.					
Goodwill Industries					
Health South RIOSA					
Mission Road Development Center			7		
Oberthur Gaming Tech.					
Randolph-Brooks Federal Credit Union					
San Antonio - Bexar County MPO			1		
San Antonio Express-News					
San Antonio Federal Credit Union					
Science Applications International Corp (SAIC)					
State Bank & Trust of Seguin, Texas					
Town of Hollywood Park					
WellMed at Greenway Park					
City of China Grove					
Marion ISD					
City of Castle Hills					
LeadingEdge Personnel			20		
VIA Metropolitan Transit Authority					
John B. Sanfilippo & Son					
YMCA of San Antonio & the Hill Country					
Comal ISD					
Northside ISD					
Texas Department of Human Services					35
Southwest Texas State University					
Education Service Center, Region 20					
Harlandale ISD					
Southside ISD					
Focus Direct, Inc.					
Wallace L. Boldt, General Construction, Inc.					
Southwest Mental Health Center				15	
Our Lady of the Lake University					
VNA & Hospice					
Sterling Metal Products					
Harlandale ISD (Maintenance Department)					
LaVernia ISD					
Schertz-Cibolo-Universal City ISD					
Tobin International Ltd.					
San Antonio Housing Authority					
Valero Energy Corporation					
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37 SPTG, Lackland Air Force Base					
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San Antonio Police Department					
U.S.A.A.					
Dee Howard Aircraft Maintenance, L.P.					
San Antonio Independent School District					
U.S. Army Garrison, FSH, TX.					
Standard Aero (San Antonio), Inc					
Zachry Construction Corporation					
Morningside Ministries					
311 Human Systems Wing – Brooks AFB, TX					
Texas Department of Transportation					
Total Future Employee Participation per Program	0	0	28	15	47
Total Future Employee Participation	90				
Total Future Company Participation	18				
Total Not Partipating in Future A.W.S.	42				
Companies will expand, gave no details	12				
Companies will expand, gave details	6				

Table K-21. 1999 TDM Participation Rates and 2007 TDM Forecasted Participation in the San Antonio Metropolitan Area

Participation	1999 Total	2007 Total Participation
Summer		
All Programs	37,282	40,357
Flex Time	4,537	4,552
Compressed WW 4/40	9,204	9,680
Compressed WW 9/80	3,211	3,211
Staggered Hours	19,504	22,041
Telecommuting	827	874
Fall		
All Programs	38,514	41,590
Flex Time	4,537	4,552
Compressed WW 4/40	10,437	10,913
Compressed WW 9/80	3,211	3,211
Staggered Hours	19,504	22,041
Telecommuting	827	874
1999 & Anticipated 2007 VOC Emission Reduction Estimates (lbs/day)		
Category	All TDMs 1999	All TDMs 2007
Summer Peak Hour Reduction	470	386
Fall Peak Hour Reduction	430	388
1999 & Anticipated 2007 NOx Emission Reduction Estimates (lbs/day)		
Category	All TDMs 1999	All TDMs 2007
Summer Peak Hour Reduction	436	422
Fall Peak Hour Reduction	426	420

TDM Emission Reduction Methodologies

The transportation demand management (TDMs) discussed in this summary are programs implemented within the San Antonio metropolitan area to reduce vehicle miles traveled (VMT) and shift remaining traffic to off-peak hours. The data reflect the current TDM participation rates and future TDM commitments of companies in the San Antonio metropolitan area with employment population greater than 100 and government

agencies. The TDMs used in this plan are broken down into several categories including: Rideshare, Telecommuting, Flex Time, Compressed Workweek, and Staggered Hours. All of these programs are voluntary and are offered at either the employer or employee level.

The first step in conducting the study involved an extensive survey, which was mailed out to 361 organizations in the AACOG region. 120 responses were received and the data from those surveys were tabulated for further analysis using the Commuter Model. The results were then entered into the Commuter Model, which calculated the emission and VMT reductions based on pertinent data such as: work trip length, vehicle occupancy, length of peak period, etc. Using the output from the Commuter Model and the anticipated TDM participation rates for 2007, the projected emission and VMT reductions were determined.

There was a significant difference in the participation rate for the September and July episodes, specifically, in level of participation in the Compressed Workweek 4/40 plan. Because of seasonal participation by educational institutions (teachers, administrators, maintenance and custodial employees, bus drivers, etc.), approximately 1200 employees who participate in the plan during the academic year do not participate during the summer season. Therefore based on the July rate of participation for the 4/40 plan, no increase in participation for this plan for the year 2007 is projected; whereas based on the September data, a 4.36% increase in the Compressed Workweek 4/40 plan is expected.

The survey conducted on TDM participation showed that Staggered Hours was the most widely used TDM in this region, followed by Compressed Workweeks, Flex Time, and Telecommuting. Overall, for the year 2007 projection, these TDMs are expected to reduce VOC's by 3.3% and NO_X by 2.4%, which are all produced by on-road sources during peak hours.

Voluntary Air Quality Control Strategies

An integral part of air quality planning for the San Antonio EAC Region is the involvement of area leaders in business and industry, local school district officials, and other agencies in the adoption of voluntary measures. As part of the Clean Air Plan, AACOG compiled a special list of participating businesses and agencies within the area that have begun to adopt voluntary measures which will help clean the air. Responding companies and agencies categorized their actions as "Commitment Measures" or "Voluntary Measures" for incorporation into the plan.

> Commitment Measures - These commitments are provided to the Texas Commission on Environmental Quality (TCEQ) and the US Environmental Protection Agency (EPA) as part of the Clean Air Plan and the State Implementation Plan (SIP). The commitments are evidence of an ongoing commitment by local leaders in support of clean air policy.
>
> Voluntary Measures - These commitments will be done on a voluntary basis to minimize emissions to the best of a company's ability.

It is important to understand that the following commitments were obtained from the agencies, and authorized by signature. The authorization consent form signed contains the following specific language, followed by the signature block:

> Authorization - I authorize the Air Improvement Resources Committee to include our actions and commitments, as described and classified above (referring to the "Commitment" and "Voluntary" definitions above), in the Clean Air Plan that will be submitted to EPA and TCEQ. I understand that copies of our letters describing our commitment may be included in the Clean Air Plan.

A copy of one of the signed commitment letters (from the San Antonio Water System) is attached to the end of this appendix as an example of this process and the form mailed out to each agency.

The following pages contain strategy descriptions of companies, agencies, and school districts that have volunteered to practice these air-cleaning strategies.

Bexar County

Commitment Measures: Commitment letter signed by Renee D. Greene, P.E. – Director of Environmental Service, Bexar County, February 4, 2004

Converted eighty percent of its eligible fleet to propane.
Alternative fuels with low Reid Vapor Pressure (RVP) are purchased for gasoline powered vehicles.
Providing bus pass subsidies to all employees
A public outreach program has been developed and information is posted on the county's website.
On Air Quality Health Alert Days, the county suspends activities such as refueling, paving, mowing and painting. Air Quality Health Alert flags are flown at all county offices.
Low RVP gasoline is used in all Bexar County sheriff patrol vehicles. The County continues to replace fleet vehicles with low emission vehicles (LEV).
Texas Ultra Low Sulfur Diesel Fuel is used in Bexar County diesel fleet vehicles.

Voluntary Measures

Encourage employees to use general energy conservation measures (i.e., turn off lights and equipment when they are not in use, at home and at work.
Maintain fleet vehicles and buses according to manufacturer's tune-up and emissions control standard.
Post signs at facilities promoting ozone reduction measures.
Commit to using cleaner burning fuel
Achieve code compliance in the International Energy Conservation Code (IECC).

City of Converse
Commitment Measures: Commitment letter signed by Sam Hughes – City Manager, City of Converse, March 16, 2004
Encourage employees to use general energy conservation measures (i.e., turn off lights and equipment to reduce power load when not in use, both at work and home).
Maintain fleet vehicles and buses according to manufacturer's tune-up and emissions standards.
Refuel fleet vehicles and buses carefully and in the cooler evening hours during an AQHA.
Instruct employees and fleet drivers to practice efficient driving such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration, and driving 55 mph maximum.

Voluntary Measures
Give incentives to those employees who are participating in a carpool or vanpool.
Encourage employees to bring lunch to work or walk to avoid car travel during lunchtime.

City of Leon Valley
Commitment Measures: Commitment letter signed by the Honorable Marcy Meffert, Mayor of the City of Leon Valley, March 11, 2004
Encourage employees to use general energy conservation measures (i.e., turn off all lights and equipment to reduce power load, both at work and home).
Maintain all 55 fleet vehicles and buses according to manufacturer's tune-up and emissions control standards.
Refuel all fleet vehicles and buses during cooler evening hours during an AQHA.
Will limit the use of oil-based paints, varnishes and degreasers to days that are not AQHA days.
Instruct all employees and fleet drivers to practice efficient driving, such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration and driving 55mph maximum.
Post signs at facilities promoting ozone reduction measures at 3 city-owned locations.
Achieve code compliance in the International Energy Conservation Code (IECC).

Voluntary Measures
Consider alternative fuels for vehicle fleets (10 or more vehicles per fleet).
Participate in voluntary vehicle emissions testing and maintenance programs.
Encourage approximately 30% of city employees to bring a lunch or walk to avoid car travel during lunchtime.
Commit to using cleaner burning fuel when financially feasible.

City of San Antonio (COSA)

Commitment Measures: Commitment letter (subject to further City Council action) signed by David E. Newman – Environmental Services Manager, City of San Antonio, March 5, 2004

Allow flextime or telecommuting for approximately 3000 city employees.
Maintain fleet vehicles according to manufacturers tune-up and emission control standard. The City performs inspection/maintenance on approximately 3000 city fleet vehicles.
Consider alternative fuels for small vehicle fleets. Approximately 900 city fleet vehicles are currently alternative fuel vehicles.
Post signs at facilities promoting ozone reduction measures for 12,000 city employees.
Commit to using cleaner burning fuel.
Delay construction operations, such as pothole repair, street striping, and mowing activities, to days that are not Air Quality Health Alert days.
Stage II VRS are in place on gasoline dispenser pumps at four service centers and police/fire substations.
Use thermoplastics for highway markings
COSA's Landscape and Tree Preservation Ordinance attempts to preserve existing trees, encourage the planting of new trees, and encourage responsible development.
Prohibit use of approximately 20 motorpool vehicles on AQHA days.

Voluntary Strategies

Requested and obtained a lower RVP level for all gasoline shipped into the San Antonio metropolitan region for the ozone season of 1999.
Stage I Vapor Recovery Systems (VRS) are in place on UST's at all city fueling facilities.
The Purchasing Department implements a modified I/M program using a four-gas emission analyzer. All vehicles are tested by the I/M Program during the annual safety inspection.
To encourage employee bus ridership, the City has a bus pass subsidy program for its employees. The City offers approximately 1500 bus pass subsidies at $5 off.
Synchronization of stoplights by COSA.
Public Outreach Participation.
Sponsorship of Public Vehicles Emissions Testing & Media Events.
Creation of a COSA-wide Air Quality Health Alert Program.
Creation of Intelligent Transportation System (TransGuide).
Encourage approximately 12,000 employees to use general energy conservation measures (ie. Turn off lights and equipment to reduce power load when not in use, both at work and home).
Instruct employees and fleet drivers to practice efficient driving such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration, and driving 55 mph maximum.
Successfully apply for emissions reductions grants available through theTexas Emission Reduction Program (TERP).
Expedited permitting for mixed use, transit oriented or in-fill development
Use low VOC striping material.
Open burning restrictions.
Renewable energy program.
Low emission vehicles.
Offer direct deposit to employees.
Fuel city-owned vehicles during the cooler, evening hours.
Promote limiting the idling of city-owned vehicles.

Transit-Oriented Development.
Encourage approximately 12,000 employees to carpool by giving incentives for carpooling activities.
Encourage approximately 12,000 employees to bring a lunch or walk to avoid car travel during lunchtime.
Achieve code compliance in the International Energy Conservation Code (IECC).
Limit use of oil-based paints, varnishes, and degreasers in the city's sign shop during an AQHA.

City of Stockdale
Voluntary Measures: Letter signed by the Honorable Tony Malik, Mayor of the City of Stockdale, February 20, 2004
Encourage employees to use general energy conservation measures (i.e., turn off all lights and equipment to reduce power load, both at work and home).
Maintain fleet vehicles according to manufacturer's tune-up and emissions control standards.
Post signs at facilities promoting ozone reduction measures.
Refuel fleet vehicles carefully and in the cooler evening hours during an AQHA.
Will limit the use of oil-based paints, varnishes and degreasers to days that are not AQHA days.
Instruct employees to practice efficient driving, such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration and driving 55mph maximum.

City Public Service (CPS)
Commitment Measures: Commitment letter signed by Joe Fulton – Director, Research and Environmental Management, City Public Service, March 19, 2004
Renewable Energy Program – Windtricity program launched in April 2000
Emission Reduction Program
CPS has reduced NOx at gas and coal units to 50% of 1997 levels and will "net out" of NOx emissions when the new coal unit is scheduled to come on line in 2009.
CPS' program includes combustion tuning and installation of advanced technology.
CPS has state and federal air permits for all gas and coal units.
New combined cycle gas turbine and simple cycle gas turbines have add-on NOx controls.
New coal unit will have BACT controls of NOx, sulfur dioxide and particulate matter.
An additional monitoring station will be operated on the southeast side of San Antonio monitoring NOx, SO2, CO, PM-10 and PM 2.5. This will be in addition to the current operating station. Also, four PM-10 monitors will be located on all four sides of the coal plant property.
Two compressed natural gas (CNG) trucks are operated and a CNG station is used to fuel the vehicles.
Fleet Vehicle Emission Reductions
CPS uses ethanol (E-85) in approximately 136 flex-fueled vehicles.
Two hybrid vehicles (Super Ultra Low Emission Vehicles) purchased
Two compressed natural gas (CNG) trucks used.
Night fueling service – approximately 300 fleet vehicles or equipment are fueled at night
Vehicles periodically checked with 2-gas analyzer and opacity meter.
Texas Emissions Reduction Program (TERP) grant successfully obtained for diesel engine bulldozer

Purchase of five propane forklifts
Removal of older vehicles and equipment that have been replaced by vehicles and equipment that meet today's more stringent emissions standards.

Voluntary Measures
Give incentives to CPS employees that are interested and participating in a carpool.
Give incentives to CPS employees that are interested and use buses for their daily trip to work.
Encourage approximately 2500 CPS employees to bring a lunch or walk to avoid car travel during lunchtime via email notices.
All flextime or telecommuting for CPS employees for which this option is feasible and allowed by the management of that area.
Encourage approximately 2500 CPS employees to use general energy conservation measures (i.e., turn off lights and equipment when they are not in use, at home and at work.)
Maintain CPS fleet vehicles according to manufacturer's tune-up and emissions control standard.
Instruct approximately 2500 CPS employees and fleet drivers to practice efficient driving, such as, avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration, driving 55 mph maximum.
Limit use of oil-based paints, varnishes, and degreasers during an AQHA.

Fort Sam Houston Independent School District
Commitment Measures: Commitment Letter signed by Gail E. Siller – Superintendent, Fort Sam Houston ISD, February 25, 2004
Instruct employees and fleet drivers to practice efficient driving such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration and driving 55 mph maximum.
Encourage 225 district employees to use general energy conservation measures (i.e., turn off lights and equipment when they are not in use, at home and at work).
Maintain 10 district buses according to manufacturer's tune-up and emissions control standard.
Will not mow the lawn or use gas powered lawn equipment during an AQHA on the two district campuses.

Guadalupe County
Voluntary Measures: Letter signed by Stan Burrier – County Engineer, Guadalupe County, March 17, 2004
Employees are encouraged to participate in voluntary programs, such as carpooling whenever possible.
Encourage employees to bring a lunch of walk to avoid car travel during lunchtime.
Encourage employees to use general energy conservation measures (i.e., turn off lights and equipment when they are not in use, at home and at work).
Maintain fleet vehicles and buses according to manufacturer's tune-up and emissions control standard.
Instruct employees and fleet drivers to practice efficient driving, such a, avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration, driving 55 mph maximum.

Harlandale ISD

Commitment Measures: Commitment letter signed by Henry Galindo - Director of Transportation and Maintenance Support, Harlandale ISD, February 10, 2004

Uses nine alternative fuel buses and will continue to consider alternative fuels for all vehicle purchases.

Maintain 150 maintenance vehicles and 59 buses according to manufacturer's tune-up and emissions control standard.

Consider alternative fuels for vehicle fleets (10 or more vehicles per fleet).

Will not mow lawns or use gas powered lawn equipment during an AQHA at all 25 district facilities.

Will limit the use of oil-based paints, varnishes, and degreasers to days that are not designated as AQHA days at all 25 district facilities.

Instruct employees and fleet drivers to practice efficient driving, such as, avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration, driving 55 mph maximum.

Voluntary Measures

Encourage all 2,100 employees to use general energy conservation measures (i.e., turn off lights and equipment when they are not in use to reduce power load, both at home and at work).

Lackland Independent School District

Commitment Measures: Commitment letter signed by David F. Splitek – Superintendent, Lackland ISD, February 9, 2004

Encourage employees to use general energy conservation measures (i.e., turn off lights and equipment to reduce power load when not in use, both at work and home).

Maintain fleet vehicles and buses according to manufacturer’s tune-up and emissions control standard.

Will not use oil-based paints, varnishes or degreasers on days that are AQHA’s.

Encourage employees to bring lunch to work or walk to lunch to avoid car travel during lunchtime.

Instruct employees and fleet drivers to practice efficient driving such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration and driving 55 mph maximum.

Post signs at facilities promoting ozone reduction measures

Investigate the possibility in applying for emission reduction grants through the Texas Emissions Reductions Plan (TERP).

Will comply to a feasible extent the delay of construction operations (using gasoline or diesel equipment) to days that are not Air Quality Health Alert days.

During an AQHA, fleet vehicles and buses will be refueled in the cooler evening hours when possible.

Gas powered lawn equipment will not be used during an AQHA. Rather, grounds personnel will be assigned alternative tasks.

Voluntary Measures

Consider alternative fuels for vehicle fleets (10 or more vehicles per fleet).

Participate in voluntary vehicle emissions testing and maintenance programs.

Give incentives to those employees who are participating in a carpool

Give incentives to those employees who use buses for their daily trip to work

Check availability of fuel stations that dispense cleaner burning fuel.

Will explore International Energy Conservation Code (IECC) compliance.

Our Lady of the Lake University
Voluntary Measures: Letter signed by Darrell Glasscock – Director of Physical Plant, Our Lady of the Lake University, February 13, 2004
Encourage employees to use general energy conservation measures (i.e., turn off lights and equipment to reduce power load when not in use, both at work and home).
Maintain fleet vehicles and buses according to manufacturer's tune-up and emissions standards.
Post signs at facilities promoting ozone reduction measures.
On Air Quality Health Alert Days, the University will not mow the lawn or use gas powered lawn equipment.

Randolph Air Force Base
Commitment Measures: Commitment letter signed by Colonel Mark W. Graper – USAF, Commander, 12th Flying Training Wing, February 25, 2004
Converted from higher volatility fuel (JP-4) to a more environmentally friendly JP-8 fuel.
Encourage RAFB populace of 17,000 to use general energy conservation measures (ie. Turn off lights and equipment to reduce power load when not in use, both at work and home).
Consider alternative fuels for vehicle fleets. Currently, over 60 vehicles have been converted to alternative fuel capability.
Post signs at facilities promoting ozone reduction measures.
Encourage RAFB populace of over 17,000 people to bring a lunch or walk to avoid car travel during lunchtime.
Maintain approximately 280 fleet vehicles and buses according to manufacturer's tune-up and emissions control standard.
Instruct the base populace of over 17,000 people to practice efficient driving, such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration, driving 55 mph maximum.

Voluntary Measures
Elevated research on development of sources for fuel alternatives. Review new technologies to ensure that they comply and that law does not hinder the use of new technologies.
During AQHA days, refuel fleet vehicles and buses carefully and in cooler evening hours and on days that are not AQHA days.
On AQHA days, will not use oil-based paints, varnishes, or degreasers on days that are AQHA's.

San Antonio / Bexar County Metropolitan Planning Organization
Commitment Measures: Commitment letter signed by Jeanne Geiger – Deputy Director, San Antonio-Bexar County MPO, March 9, 2004
Provides funding for the Rideshare Program
Participating in an ongoing public outreach program that encourages commuters to consider alternatives to driving alone.
Allow employees to use flextme to encourage travel outside of the peak periods. Eight of eight employees use flex time.

The MPO flies the AQHA flag on appropriate days to help create awareness of the AQ situation.

Voluntary Measures
Encourage employees to bring lunch or walk and/or carpool to lunch to reduce cold starts and emissions.
Encourage employees to use general energy conservation measures (i.e., turn off lights and equipment when they are not in use at home and at work.)
Instruct employees to practice efficient driving, such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration, driving 55 mph maximum.

San Antonio Water System
Commitment Measures: Commitment letter signed by Eugene E. Habiger – President/Chief Executive Officer, San Antonio Water Systems, March 2, 2004
SAWS has an internal Air Quality Committee that meets as needed to update or address air quality issues that affect SAWS operations.
Once a year SAWS distributes information to 280,000 customers, encouraging them to practice emission reduction measures during the ozone season.
Encourage employees to use general energy conservation measures.
At SAWS, demand side management is practiced.
A lighting erplancement program to high efficiency T8 lighting with electronic ballasts is in place at the SAWS Service Centers and will be implemented at all other SAWS owned facilties.
An energy database is being created to determine pump efficiencies.
Building heating and cooling leaks will be determined using thermal imaging, as well as, preventative maintenance for pumps by setting thermal baselines.
Evaluating all existing HVAC systems.
Evaluating new roofing.
Central Heating & Cooling retrofits.
Maintain fleet vehicles according to manufacturer's tune-up and emissions control standards.
Considers alternative fuels for vehicle fleets.
Have 5 propane trucks and 5 propane forklifts.
Have 69 bi-fuel (unlead/propane) vehicles and 4 electric forklifts.
Working with AACOG, Ford, and CleanFuels on a LPG Fueling Station at the new Northwest Service Center.
Looking into testing hydrogen fuel cell powered vehicles.
Continue to post AQHA signs at SAWS facilities when an AQHA is issued.
Flags and signs will be posted at the following Water Recycling Centers: Dos Rios, Leon Creek, Salado Creek, and Medio Creek.
Flags and signs will be posted on the following Service Centers: Eastside, Mission Road, Northeast, Northwest, and Van Dyke.
Will institute contract language to preclude mowing lawns or using gas-powered lawn equipment during an AQHA.
Encourage employees to bring lunch to work to avoid car travel during lunchtime.
Instruct employees and fleet drivers to practice efficient driving, such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration.
Stage I and II Vapor Recovery Systems at fleet fuel sites. Fleet fuel sites:

Dos Rios
Eastside Service Center
Northeast Service Center
Northwest Service Center
Mission Road
Van Dyken
SAWS is currently complying with SECO reporting requirements in achieving code compliance in the International Energy Conservation Code (IECC).
Once a year, SAWS distributes information to approximately 340,000 accounts about encouraging them to practice emission reduction measures during the ozone season.

Voluntary Measures
Allows flextime, compressed workweek, and / or telecommuting for employees.
To encourage bus ridership, SAWS has a bus pass subsidy program for its employees.
Consider posting signs and flags at SAWS facilities promoting ozone reduction measures.
The Kelly Service Center is considering posting a flag and sign.
The following Heating & Cooling Facilities are considering posting flags and signs: Central, Alamodome, Brooks, and Kelly.
Commit to using cleaner burning fuel.
Successfully apply for emissions reductions grants available through the TeXas Emissions Reductions Plan (TERP).
Refuel fleet vehicles in the cooler evening hours during an AQHA.
Limit use of oil-based paints, varnishes, and degreasers during an AQHA in parts-washers procedures.

Seguin Independent School District
Commitment Measures: Commitment document signed by Rene Ramos, Chief Operations Officer, Seguin ISD, February 13, 2004
The district does not use oil-based paints.
A district-wide energy conservation program has been implemented. Energy conservation measures are included in district procedure manual.
Maintain fleet vehicles (26) and buses (54) according to manufacturer's tune-up and emissions control standards.
Encourage employees (1,068) to use general energy conservation measures (i.e., turn off lights and equipment to reduce power load when not in use, both at work and home).
Post signs at facilities promoting ozone reduction measures.
Do not mow lawns or use gas-powered lawn equipment during an AQHA. Grounds personnel will be given alternative duties.
Refuel district's 26 maintenance vehicles and 54 buses during cooler evening hours during an AQHA.
Limit use of oil-based paints, varnishes and degreasers to days that are not designated AQHA days. Painters will be instructed on measures during an AQHA.
Instruct employees and fleet drivers to practice efficient driving, such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration, driving 55 mph maximum during employee training sessions.
Post signs at facilities promoting ozone reduction measures in a district-wide email forum.

Voluntary Measures

Encourage employees to bring lunch to work or walk to lunch to avoid car travel during lunchtime by providing a break area and opportunities to by lunch in office.

South San Antonio ISD

Commitment Measures: Commitment letter signed by Ruben G. Flores – Administrator, South San Antonio ISD, February 26, 2004

Encourage employees to use general energy conservation measures (i.e., turn off lights and equipment to reduce power load when not in use, both at home and work) during staff/faculty meetings.

Maintain fleet vehicles and buses according to manufacturer's tune-up and emission control standard.

Participate in voluntary vehicle emissions testing and maintenance programs.

Refuel fleet vehicles and buses carefully and in the cooler evening hours during an AQHA.

All maintenance personnel will be informed about limiting use of oil-based paints, varnishes, and degreasers to days that are not AQHA days.

Encourage employees to bring lunch or walk to avoid car travel during lunchtime.

Instruct employees and fleet drivers to practice efficient driving such as avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration and driving 55mph, maximum.

Post signs at facilities promoting ozone reduction measures at district schools and administrative offices.

All maintenance personnel will be informed to not mow lawns or use gas powered lawn equipment during an AQHA.

Voluntary Measures

South San Antonio ISD will research and evaluate the consideration of alternative fuels for district vehicle fleet.

Texas Department of Transportation (TxDOT)

Commitment Measures: Commitment letter signed by Ken Zigrang – District Planner, TxDOT, March 19, 2004

TxDOT allows VIA to operate and maintain 4 VIA Park and Ride public parking facilities for the public to access VIA buses on state highway right-of way through Multiple Use Agreements.

TxDOT maintains 25 carpool public parking facilites in San Antonio and the surrounding area counties on state highway right-of-way for citizens to use for carpooling.

TxDOT allows the City of San Antonio to operate and maintain 16 general public parking areas on state highway right-of-way through Multiple Use Agreements.

Courtesy Patrol Crews assist stranded motorists on Bexar County freeways 24 hours per day thus heloing minimize obstructions and traffic congestion.

For highway maintenance in Bexar County, postpone highway mowing on the right-of-way until after 12:00 noon on Air Quality Health Alert (AQHA) days.

For highway construction and maintenance, postpone of delay highway work activities that require lane closures and would result in significant traffic congestion.

Propane fueling facilities were installed at all 16 maintenance offices in San Antonio District in FY 2002.

Use of TransGuide changeable message signs to inform motorists of vehicle accidents ahead, estimated travel times, lanes closed, detours etc. and thereby help reduce

congestion and minimize the time required to open lanes after accidents and other highway incidents.
Maintain state vehicles according to manufacturer's tune-up and emissions control standards.
Continue to purchase alternative fueled sedans and pick-ups for the state fleet.
TxDOT has in place several strategies to allow flexibility on Air Quality Health Alert Days. These include but are not limited to:
Notifying all employees of pending Air Quality Health Alert Days by electronic mail the day before; allowing employees to better plan their travel.
Refueling of TxDOT vehicles is restricted until the cooler evening hours.
TransGuide messages to travelers to limit driving due to ozone levels.
Postpone lawn mowing or use of gas powered lawn equipment at office grounds and for landscape maintenance contracts on AQHA days.
In highway construction, contractors may not close any lanes during rush hours.
Use alternative fuels in state vehicles.
Agency diesel vehicles are fueled with Tx-LED

Voluntary Measures
Utilizing flextime by employees, staggering staff arrival to avoid rush hour during the ozone season.
During AQHAs, ask outlying offices to restrict travel to the main complex.
Use of propane fuel in state vehicles in strongly encouraged.
Encourage employees to use energy conservation measures (ie., turn off vehicle engines when not in use at home and at work).
Instruct employees to practice efficient driving practices such as avoiding excessive idling, minimizing cold starts by combining trips, and avoiding jackrabbit acceleration.
Ask outlying offices to postpone or minimize travel to the district headquarters complex.

UT Health Science Center at San Antonio
Commitment Measures: Commitment letter signed by Michael A. Charlton, Ph.D. – Director of Environmental Health and Safety, UTHSCSA, February 27, 2004
An on-site vehicle preventive maintenance program to reduce fleet vehicle emissions.
The University has a lighting retrofit project in place, which will decrease energy consumption.
Maintain fleet vehicles and buses according to manufacturer's tune-up and emissions control standard on all UTHSCSA vehicles.
All grounds keeping staff will not mow lawns or use gas-powered lawn equipment during an AQHA.
Refuel vehicles and buses carefully and in the cooler evening hours during an AQHA.
All Paint Shop employees will limit use of oil-based paints, varnishes, and degreasers to days that are not an AQHA.
Have reduced the number of University Police vehicles and have officers on bike patrol.

Voluntary Measures
Participate in voluntary vehicle emissions testing and maintenance programs.
Allow flextime, compressed workweek, and/or telecommuting to employees. The University has policies in place for flextime and telecommuting, with a 20 % employee participation rate.
Encourage employees to use general energy conservation measures (i.e., turn off lights and equipment to reduce power load when not in use, both at home and work).

Instruct employees and fleet drivers to practice efficient driving, such as avoiding successive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration, driving 55 mph.
Consider alternative fuels for vehicle fleets (10 or more vehicles per fleet).
Encourage employees to bring lunch to work or walk to avoid car travel during lunchtime.

Further Ozone Reduction Measures
UTHSCSA has entered into a contract to upgrade boiler controls and reduce emissions from the main campus central energy plant. Upgrades will be done by July 31, 2005 and include emissions controls, burner management system, combustion controls, and emissions testing and verification. NOx emissions will be reduced by greater than 75%; CO will be reduced by 25%.

Valero Energy Corporation
Voluntary Measures: Letter signed by Julie Klumpyan, Government Affairs, Valero Energy Corporation, March 12, 2004
Valero provided lower RVP gasoline during the ozone season of 1998.
All area refineries voluntarily provided lower RVP (7.8) during ozone season of 1999.
Valero Energy Corporation has provided fuel with a lower average sulfur level (150 ppm or less) in their gasoline over the past three years.
Valero now produces Texas Low Emission Diesel.
Valero's Three River's Refinery averaged 80 ppm sulfur in 2003.
Encourage employees to bring a lunch or walk to avoid car travel during lunchtime.
Valero Energy Corporation has a company cafeteria which reduces car travel during lunch.

VIA Metropolitan Transit
Commitment Measures: Commitment letter signed by Priscilla Ingle – Vice President Public Affairs, VIA Metropolitan Transit, February 26, 2004
Diesel Fleet Emissions Reductions
Voluntarily retrofitted all pre 19998 EPA emissions certified, Heavy-Duty (HD), diesel powered buses with exhaust catalysts (catalytic converters).
Since 1999, 345 early model, HD diesel buses have been replaced with late model propane and clean burning, diesel engine HD buses for a minimum 67% reduction in NOx emissions.
61 HD buses better CFFV ULEV emissions standards.
Streetcars:
5-each, diesel powered streetcars replaced with LPG (CFFV LEV) streetcars for a 71% reduction in NOx emissions on a per vehicle basis.
4-each, diesel powered streetcars repowered with LPG (CFFV LEV) engines for a 56% reduction in NOx emissions on a per vehicle basis.
Bus Garage Improvements
Currently expanding LPG fuel dispensing capacity
Replacing solvent based parts cleaners with water/steam type cleaners
On-Street Improvements
Bike racks on all HD buses
Instruct employees and fleet drivers to practice efficient driving, such as, avoiding excessive idling, minimizing cold starts by combining trips, avoiding jackrabbit acceleration, driving 55 mph maximum. These practices are taught and monitored.
Electricity Consumption

Committed to include International Energy Conservation Codes on new construction projects.

Voluntary Measures
Propane (LPG) Fleet Emissions Reductions
Operates alternatively fueled (LPG) vehicles
92-each, dedicated and bi-fuel, transit patrol cars and support vehicles
105-each, dedicated LPG, paratransit vehicles
67-each, dedicated LPG, 30-ft passenger buses certified to CFFV LEV standards
9-each, dedicated LPG, streetcars. Certified to CFFV LEV standards
A TERP grant application is being prepared to repower/retrofit 67 each CFFV LEV propane engines to achieve a 28% reduction in NOx emissions on a per vehicle basis, bettering CFFV ULEV standards.
Preparations are underway to replace the current paratransit fleet vehicles with new vehicles that are expected to better CFFV ULEV standards and provide a minimum, 70% reduction in NOx emissions on a per vehicle basis.
Supports efforts to expand the use of propane as an automotive fuel
Provides propane related technical support to other fleets
Actively participates in propane engine and motor fuel R&D
Diesel Fleet Emissions Reductions
281 HD buses operate on Diesel #1 versus Diesel #2 for reduced levels of NOx and PM emissions.
61 HD buses operated on Texas Low Emissions Diesel (ULSD).
Preliminary grant approval has been received to retrofit 217 diesel powered HD buses with EGR and PM filters. One retrofitted the NOx emissions, on a per vehicle basis, will be reduced at least 40% and will better CFFV ULEV standards.
Preliminary grant approval has been received to fund the pull-ahead use of Texas Low Emission Diesel in all pre-2004 emissions certified HD diesel buses for a 7% reduction in NOx.
Scheduled to replace, within 2 years, 1998 and 1992 year model HD buses to achieve a 77% and 50% (respectively) reductions in NOx emissions on a per vehicle basis.
Within 2-years, following the approval and implementation of retrofit and replacement programs, all diesel operated HD buses are expected to operate at emissions levels that are better CFFV ULEV standards. This reduction will provide an overall 46% reduction in diesel fleet NOx emission compared to current (early 2004) levles and a 77% reduction in HD diesel fleet NOx emissions since 1999.
Bus Garage Improvements
Recovers paint solvents
Planned CARB compliant booth replacement
61-buses equipped with dry-break fuel nozzles
On-Street Improvements
Tree planting at bus stops program
Employee Incentives
Provides fee fares to employee bus riders
Allows flextime reducing utility peaks
Provides reserved parking spaces for employees who carpool
Education and Cooperation:
Business

Operates a business pass program (over 100 companies currently provide bus passes to their employees on site, at cost or reduced price).
Public
Provides advertising to encourage transit ridership
Encourages employers to provide discounts as incentives to transit riders
Sponsors a yearly Environmental Symposium (3 years)
Educates students about transit (Classroom on Wheels Project)
Promotes AACOG's Guaranteed Ride Home Program
Electricity Consumption
Since 2001, VIA has reduced electricity consumption by 8%
VIA continues its efforts to reduce electricity consumption
Lighting retrofits
Employee awareness
Garage facility retrofits
VIA is an active member of the Metropolitan Partnership for Energy working to increase energy efficiency and reduce pollution in the San Antonio area.
Encourage employees to bring a lunch or walk to avoid car travel during lunchtime.
Maintain fleet vehicles and buses according to manufacturer's tune-up and emissions control standard.
Signs are posted throughout the VIA facility that promote ozone reduction measures.
Ninety percent of all vehicles are refueled after 8:00 p.m. during an AQHA.
Will not mow the lawn or use gas powered lawn equipment during an AQHA as much as possible.
Will limit the use of oil-based paints, varnishes, and degreasers during an AQHA as much as possible.

Transportation Emission Reduction Measures

Fiscal Years 2002-2003

Introduction

Transportation Emission Reduction Measures (TERMs) are strategies or actions that can be employed to offset increases in nitrogen oxide (NOx) and volatile organic compound emissions from mobile sources. All TERMs are intended to reduce either the number of vehicle trips, vehicle miles traveled, or both. These strategies may include ridesharing and telecommuting programs, clean fuel vehicle programs, which were all described in previous sections, and improved transit/ bicycling facilities, or other possible actions such as intersection improvement and signalization.

Many of the transit and highway projects included in the MPO's Transportation Improvement Programs (TIP) provided in the following pages qualify as a TERM project, as they target vehicle trip reduction and, ultimately, improvement in the air quality.

- It is important to note that TERMS can be quantified as creditable reductions. While the quantity of reductions have not been calculated and included in the attainment demonstration of the San Antonio proposed revisions to the State Implementation Plan, local air quality planners are now researching measures to make the TERMS enforceable. The region is intent on making them enforceable and calculating credit for them in coordination with the state and the local San Antonio / Bexar County Metropolitan Planning Organization. Even if credit is not taken here for the TERMS projects in the region, the benefits of the reductions accrue as Additional Evidence that the San Antonio region will reach attainment.

San Antonio-Bexar Metropolitan Area Transportation Improvement Program (TIP)
Completed FY 2002 Roadway Projects

CSJ Number: 17 2 63 Federal Cost: $22,744
Project ID: 3286 State Cost: $2,527
County: Bexar Local Cost: $0
Roadway Name: IH 35 Project Cost: $25,272
Limit From: 0.17 Miles E of Benton City Road Let Date: 8/02
Limit To: IH 410 Funding Category: 4A STP Safety
Project Description: Texturize shoulders (milled) Completion Date: 2/02

CSJ Number: 17 3 53 Federal Cost: $64,735
Project ID: 3287 State Cost: $7,192
County: Bexar Local Cost: $0
Roadway Name: IH 35 Project Cost: $71,928
Limit From: Atascosa County Line Let Date: 08/02
Limit To: 0.17 Miles E of Benton City Road Funding Category: 4A STP Safety
Project Description: Texturize shoulders (milled) Completion Date: 12/02

CSJ Number: 17 10 205 Federal Cost: $32,000
Project ID: 3110 State Cost: $8,000
County: Bexar Local Cost: $0
Roadway Name: I H 35 Project Cost: $40,000
Limit From: SB Mainlanes Let Date: 11/01
Limit To: At Coliseum Rd. Funding Category: 6A BRDG-ON SYS
Project Description: Rehabilitate bridges & approaches Completion Date: 10/02

CSJ Number: 17 10 213 Federal Cost: $1,400,850
Project ID: 3174 State Cost: $155,500
County: Bexar Local Cost: $0
Roadway Name: I H 35 Project Cost: $1,556,500
Limit From: Fratt Interchange Let Date: 05/02
Limit To: Funding Category: 2 IM
Project Description: Asphaltic overlay Completion Date: 11/02

CSJ Number: 17 10 215 Federal Cost: $247,592
Project ID: 3284 State Cost: $61,898
County: Bexar Local Cost: $0
Roadway Name: IH 35 Project Cost: $309,490
Limit From: At Coliseum & Walters Let Date: 11/01
Limit To : Funding Category: 2 IM
Project Description: Landscape development & right turn lanes Completion Date: 10/02

CSJ Number: 25 2 161 Federal Cost: $1,800,000
Project ID: 3264 State Cost: $200,000
County: Bexar Local Cost: $0
Roadway Name: IH 10 Project Cost: $2,000,000
Limit From: On IH 10 at Houston Let Date: 11/01
Limit To: Funding Category: 2 IM
Project Description: Restore existing SB frontage road Completion Date: 10/02

CSJ Number: 25 2 162 Federal Cost: $98,820
Project ID: 3288 State Cost: $10,980
County: Bexar Local Cost: $0
Roadway Name: IH 10 Project Cost: $109,800
Limit From: IH 410 Let Date: 08/02
Limit To: Guadalupe County Line Funding Category: 4A STP Safety
Project Description: Texturize shoulders (milled) Completion Date: 12/02

CSJ Number: 25 2 163 Federal Cost: $1,440,000
Project ID: 3330 State Cost: $160,000
County: Bexar Local Cost: $0
Roadway Name: IH 10 Project Cost: $1,600,000
Limit From: at Loop 1604 Let Date: 08/02
Limit To: Funding Category: 2 IM
Project Description: Reconfiguring Intersection Completion Date: 02/04

CSJ Number: 72 12 159 Federal Cost: $66,061,360
Project ID: 703 State Cost: $16,515,340
County: Bexar Local Cost: $0
Roadway Name: IH 10 Project Cost: $82,576,700
Limit From: 0.2 Mi S of Callaghan Rd. Let Date: 07/02
Limit To: 0.2 Mi S of Crossroads Blvd. Funding Category: 3A NHS Mobility
Project Description: Reconstruct Interchange & TMS Completion Date: 02/08
(Phase 2) IH 10/IH 410 (Phase 2)

CSJ Number: 521 4 242 Federal Cost: $768,000
Project ID: 3283 State Cost: $192,000
County: Bexar Local Cost: $0
Roadway Name: IH 410 Project Cost: $960,000
Limit From: At SH 151 Let Date: 06/02
Limit To: Funding Category: 3E NHS Misc
Project Description: Construct turnarounds at IH 410 & SH 151 Completion Date:
08/04

CSJ Number :521 5 120 Federal Cost: $59,374
Project ID: 3289 State Cost: $6,597
County: Bexar Local Cost: $0
Roadway Name: IH 410 Project Cost: $65,972
Limit From: US 281 Let Date: 08/02
Limit To: IH 35 Funding Category: 4A STP Safety
Project Description: Texturize shoulders (milled) Completion Date: 12/02

CSJ Number: 521 5 121 Federal Cost: $46,331
Project ID: 3331 State Cost: $5,147
County: Bexar Local Cost: $0
Roadway Name: IH 410 Project Cost: $51,479
Limit From: IH 35 Let Date: 08/02
Limit To: US 90 Funding Category: 4A STP Safety
Project Description: Texturize Shoulders (Milled) Completion Date: 12/02

CSJ Number: 521 6 90 Federal Cost: $88,964
Project ID: 3290 State Cost: $9,884
County: Bexar Local Cost: $0
Roadway Name: IH 410 Project Cost: $98,849
Limit From: IH 10 Let Date: 08/02
Limit To: US 281 Funding Category: 4A STP Safety
Project Description: Texturize shoulders (milled) Completion Date: 12/02

CSJ Number: 849 1 42 Federal Cost: $0
Project ID: 3350 State Cost: $85,000
County: Bexar Local Cost: $0
Roadway Name: FM 471 Project Cost: $85, 000
Limit From: 130' East of Bexar County Line Let Date: 08/02
Limit To: Bexar/Medina County Line Funding Category: 7 Prev. Maint.
Project Description: Drainage Improvement Completion Date: 12/02

CSJ Number: 915 0 79 Federal Cost: $900,000
Project ID: 3245 State Cost: $100,000
County: Bexar Local Cost: $0
Roadway Name: Districtwide Project Cost: $1,000,000
Limit From: Various locations Let Date: 01/02
Limit To: Funding Category: 2 IM
Project Description: Small sign safety upgrade (FY2002) Completion Date: 10/02
- Cat 2

CSJ Number: 915 12 228 Federal Cost: $2,029,689
Project ID: 18.1 State Cost: $0
County: Bexar Local Cost: $507,422
Roadway Name: Pleasanton Project Cost: $2,537,111
Limit From: Southcross Let Date: 12/01
Limit To: Mayfield Funding Category: 4C STP MM
Project Description: Rehabilitate & widen narrow Completion Date: 10/03
pavement for center left turn lane, provide
sidewalksand intersection improvements at
Southcross
CSJ Number :915 12 263 Federal Cost: $164,800
Project ID: 2032 State Cost: $0
County: Bexar Local Cost: $41,200
Roadway Name: Alamo Area Commute Solutions Prog. Project Cost:
$206,000
Limit From: In San Antonio-Bexar Co. Area Let Date: 08/02
Limit To: Funding Category: 4C STP MM

Project Description: Operational costs for air quality program, Completion Date: 07/03
Ridematching and carpool services

CSJ Number: 915 12 276 Federal Cost: $4,160,000
Project ID: 2050 State Cost: $0
County: Bexar Local Cost: $1,040,000
Roadway Name: Hunt Lane Project Cost: $5,200,000
Limit From: Marbach Let Date: 03/02
Limit To: US 90 Funding Category: 4C STP MM
Project Description: Reconstruct & widen for CLTL between Completion Date: 02/04
Demya & US 90 w/, sidewalks, & intersection improvements at Marbach and Adams Hill

CSJ Number: 915 12 297 Federal Cost: $1,200,800
Project ID: 2072 State Cost: $0
County: Bexar Local Cost: $300,200
Roadway Name: New World Project Cost: $1,501,000
Limit From: Crestway Let Date: 06/02
Limit To: Montgomery Funding Category: 4C STP MM
Project Description: Rehabilitate and widen narrow pavement Completion Date: 03/04
w/curbs & sidewalks

CSJ Number: 915 12 298 Federal Cost: $1,338,800
Project ID: 2073 State Cost: $0
County: Bexar Local Cost: $334,700
Roadway Name: New World Project Cost: $1,673,500
Limit From: Montgomery Dr Let Date: 06/02
Limit To: Walzem Rd (FM 1976) Funding Category: 4C STP MM
Project Description: Rehabilitate and widen narrow pavement Completion Date: 03/04
w/curbs & sidewalks

CSJ Number: 915 12 308 Federal Cost: $149,940
Project ID: 2075 State Cost: $0
County: Bexar Local Cost: $37,485
Roadway Name: Rideshare/ Air Quality Prog., FY 2001 Project Cost: $187,425
Limit From: In San Antonio-Bexar Co. Area Let Date: 10/01
Limit To: Funding Category: 4C STP MM
Project Description: Operational costs for air quality program Completion Date: 07/02

Ridematching and carpool services

CSJ Number; 915 12 309 Federal Cost: $0
Project ID: 3116 State Cost: $1,800,000
County: Bexar Local Cost: $0
Roadway Name: Park Road Project Cost: $1,800,000
Limit From: In Government Canyon State Park Let Date: 09/01
Limit To: Funding Category: 9 Park
Project Description: Construct a two lane State Park Roadway Completion Date: 03/03

CSJ Number: 915 12 340 Federal Cost: $224,880
Project ID: 3035 State Cost: $0
County: Bexar Local Cost: $56,200
Roadway Name: City Wide ADA Sidewalk Program (Pha Project Cost: $281,100
Limit From: City Wide Let Date: 01/02
Limit To: Funding Category: 4C STP MM
Project Description: Reconstruct and/or provide ADA accessible sidewalks Completion Date: 09/03

CSJ Number: 915 12 350 Federal Cost: $233,860
Project ID: 3131 State Cost: $0
County: Bexar Local Cost: $58,465
Roadway Name: Alamo Project Cost: $292,326
Limit From: Cedar Let Date: 01/02
Limit To: San Antonio River Funding Category: 4C STP MM
Project Description: Construct sidewalks Completion Date: 09/03

CSJ Number: 915 12 395 Federal Cost: $2,588,197
Project ID: 3291 State Cost: $0
County: Bexar Local Cost: $810,771
Roadway Name: Mission Trails (Espada to the Alamo) Project Cost: $3,398,968
Limit From: Phase 3A - E Southcross to Mitchell Let Date: 06/02
Limit To: Funding Category: 4B STP Enhance
Project Description: Enhance roadways, trails, and markers that lead to the Missions Completion Date: 12/03

CSJ Number: 915 12 396 Federal Cost: $162,000
Project ID: 3310 State Cost: $18,000

County: Bexar Local Cost: $0
Roadway Name: Donop Road Project Cost: $180,000
Limit From: At UPRR Let Date: 01/02
Limit To: Funding Category: 4A STP Safety
Project Description: Install railroad warning lights and gates Completion Date: 12/04

CSJ Number: 915 12 397 Federal Cost: $144,000
Project ID: 3309 State Cost: $16,000
County: Bexar Local Cost: $0
Roadway Name: South Graf Road Project Cost: $160,000
Limit From: At UPRR Let Date: 01/02
Limit To: Funding Category: 4A STP Safety
Project Description: Install railroad warning lights and gates Completion Date: 12/04

CSJ Number: 1548 2 5 Federal Cost: $0
Project ID: 3271 State Cost: $260,100
County: Bexar Local Cost: $0
Roadway Name: FM 1303 Project Cost: $260,100
Limit From: Loop 1604 Let Date: 09/01
Limit To: Wilson County Line Funding Category: 14 State Rehab
Project Description: Widen Pavement, Seal Coat & ACP Completion Date: 02/03 Overlay
CSJ Number: 3212 6 12 Federal Cost: $624,000
Project ID: 3040 State Cost: $156,000
County: Bexar Local Cost: $0
Roadway Name: Ralph Fair Rd. (FM 3351) Project Cost: $780,000
Limit From: @Fawn Mountain, Pimlico, Dietz-Elkhorn Let Date: 10/01
Limit To: a nd Fair Oaks Parkway Funding Category: 4C STP MM
Project Description: Widen pavement for left turn lanes Completion Date: 10/02

CSJ Number: 3508 1 18 Federal Cost: $13,632,000
Project ID: 3232 State Cost: $3,408,000
County: Bexar Local Cost: $0
Roadway Name: SH 151 Project Cost: $17,040,000
Limit From: 0.22 Miles West of Callaghan Rd. Let Date: 01/02
Limit To: 0.3 Miles East of IH 410 Funding Category: 4C(S) STP MM (S)
Project Description: Expand to 4 lane freeway with frontage Completion Date: 06/04 roads

CSJ Number: 3508 1 19 Federal Cost: $17,630,400
Project ID: 3233 State Cost: $4,407,600
County: Bexar Local Cost: $0
Roadway Name: SH 151 Project Cost: $22,038,000
Limit From: 0.3 Miles East of IH 410 Let Date: 06/02
Limit To: 1.00 Miles East of Loop 1604 Funding Category: 4C(S) STP MM (S)
Project Description: Expand to 4 lane freeway with rehabilitation on frontage roads Completion Date: 08/04

San Antonio-Bexar Metropolitan Area TIP
Completed FY 2002 Transit Projects

CSJ Number: N/A Federal Cost: $307,218
Project ID: 3090 State Cost: N/A
County: Bexar Local Cost: $76,804
Project Name: Revenue Vehicles Total Cost: $384,022
Project Description: Purchase Replacement Low Floor Buses Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $123,600
Project ID: 3094 State Cost: N/A
County: Bexar Local Cost: $30,900
Project Name: Revenue Vehicles Total Cost: $154,500
Project Description: Purchase Paratransit Vans Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $37,808
Project ID: 3195 State Cost: N/A
County: Bexar Local Cost: $9,452
Project Name: Preventative Maintenance Total Cost: $47,260
Project Description: Preventative Maintenance Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $90,000
Project ID: 3097 State Cost: N/A
County: Bexar Local Cost: $22,500
Project Name: Service Vehicles - Sedans Total Cost: $112,500
Project Description: Purchase Replacement Sedans Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $56,543

Project ID: 3161 State Cost: N/A
County: Bexar Local Cost: $14,136
Project Name: Service Vehicles - Trucks Total Cost: $70,679
Project Description: Purchase Service Trucks Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $1,662,046
Project ID: 3162 State Cost: N/A
County: Bexar Local Cost: $415,511
Project Name: Headquarters Rehabilitation Total Cost: $2,077,557
Project Description: PE, Final Design, Construction,
Construction Management Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $202,022
Project ID: 3022.2 State Cost: N/A
County: Bexar Local Cost: $50,506

Project Name: Passenger Facilities - Kel-Lac P&R Total Cost: $252,528
Project Description: PE, Final Design, Land Acq (if needed)
Construction, Construction Management Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $4,816
Project ID: 3171.2 State Cost: N/A
County: Bexar Local Cost: $1,204
Project Name: Passenger Facilities - US 281/Loop 1604 Total Cost: $6,020
Project Description: PE, Final Design, Land Acq (if needed)
Construction, Construction Management Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $4,816
Project ID: 3171.2 State Cost: N/A
County: Bexar Local Cost: $1,204
Project Name: Passenger Facilities - US 281/Loop 1604 Total Cost: $6,020
Project Description: PE, Final Design, Land Acq (if needed)
Construction, Construction Management Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $418,471
Project ID: 3196 State Cost: N/A
County: Bexar Local Cost: $104,618

Project Name: Passenger Facilities - Rehab P&R Total Cost: $523,089
Project Description: PE, Final Design, Land Acq (if needed)
Construction, Construction Management Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $136,609
Project ID: 3197 State Cost: N/A
County: Bexar Local Cost: $34,152
Project Name: Passenger Facilities - Bus Shelters & Benches Total Cost: $170,761
Project Description: PE, Final Design, Land Acq (if needed)
Construction, Construction Management Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $727,078
Project ID: 3113 State Cost: N/A
County: Bexar Local Cost: $181,770
Project Name: Equipment Total Cost: $908,848

Project Description: MIS Hardware Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $679,131
Project ID: 3158 State Cost: N/A
County: Bexar Local Cost: $169,783
Project Name: Equipment Total Cost: $848,914
Project Description: MIS Software Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $160,209
Project ID: 3073 State Cost: N/A
County: Bexar Local Cost: $40,052
Project Name: Equipment Total Cost: $200,261
Project Description: Miscellaneous Equipment Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $397,004
Project ID: 3170.1, 3170.2 State Cost: N/A
County: Bexar Local Cost: $99,251
Project Name: Planning Study Total Cost: $496,255
Project Description: Comprehensive Service Assessment Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $722,573
Project ID: 3169.1, 3169.2 State Cost: N/A
County: Bexar Local Cost: $180,643
Project Name: Planning Study Total Cost: $903,216
Project Description: Business Process Review Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $119,847
Project ID: 3076.1, 3076.2 State Cost: N/A
County: Bexar Local Cost: $29,962
Project Name: Passenger Facilities - Downtown West Total Cost: $149,809
Project Description: PE, Final Design, Land Acq (if needed)
Construction, Construction Management Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $205,035
Project ID: 3176.1, 3076.2 State Cost: N/A
County: Bexar Local Cost: $51,259
Project Name: Passenger Facilities - South Central Total Cost: $256,294
Project Description: PE, Final Design, Land Acq (if needed)
Construction, Construction Management Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

San Antonio-Bexar Metropolitan Area TIP
Completed FY 2003 Roadway Projects

CSJ Number: 16 7 116 Federal Cost: $729,000
Project ID: 3247 State Cost: $81,000
County: Bexar Local Cost: $0
Roadway Name: IH 35 Project Cost: $810
Limit From: 0.189 Mi N of Crestway Let Date: 01/03,000
Limit To: 0.189 Mi N of Topperwein Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal coat and overlay frontage roadsCompletion Date: 01/04

CSJ Number: 17 1 22 Federal Cost: $0
Project ID: 3275 State Cost: $381,900
County: Bexar Local Cost: $0
Roadway Name: Loop 353 Project Cost: $381,900
Limit From: 150 ft South of Loop 13 Let Date: 01/03
Limit To: Indian Creek Funding Category: 1 - Prvnt Mnt/Rehab

Project Description: Planing, Seal Coat, ACP Overlay, & Pavement Markings Completion Date: 12/03

CSJ Number: 17 10 222 Federal Cost: $270,000
Project ID: 3351 State Cost: $30,000
County: Bexar Local Cost: $0
Roadway Name: IH 35 Project Cost: $300,000
Limit From: 0.068 Mi. South of Walzem Road Let Date: 05/03
Limit To .164 Mi. S of Whirlwind Drive Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal coat and overlay frontage roads Completion Date: 01/04

CSJ Number: 24 7 44 Federal Cost: $0
Project ID: 3265 State Cost: $1,014,500
County: Bexar Local Cost: $0
Roadway Name: US 90 Project Cost: $1,014,500
Limit From: Loop 1604 Let Date: 09/02
Limit To: IH 410 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal Coat, ACP Overlay, & Pavement Markings Completion Date: 12/03

CSJ Number: 24 7 45 Federal Cost: $0
Project ID: 3266 State Cost: $593,800
County: Bexar Local Cost: $0
Roadway Name: US 90 Project Cost: $593,800
Limit From: Loop 1604 Let Date: 09/02
Limit To: SH 211 Funding Category: 1 - Prvnt Mnt/Rehab

CSJ Number: 24 7 46 Federal Cost: $0
Project ID: 3267 State Cost: $539,100
Project Description: Seal Coat, ACP Overlay, & Pavement Markings Completion Date: 12/03
County: Bexar Local Cost: $0
Roadway Name: US 90 Project Cost: $539,100
Limit From: Bexar/Medina County Line Let Date: 09/02
Limit To: SH 211 Funding Category 1 - Prvnt Mnt/Rehab:
Project Description: Seal Coat, ACP Overlay, & Pavement Markings Completion Date: 12/03

CSJ Number: 24 7 47 Federal Cost: $0
Project ID: 3268 State Cost: $44,300
County: Bexar Local Cost: $0
Roadway Name: US 90 Project Cost: $44,300
Limit From: US 90 EB Exit Ramp (Beg) Let Date: 09/02
Limit To: US 90 EB Exit Ramp (End) Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Rework Base, Seal Coat, ACP Overlay, & Pavement Markings Completion Date: 03/03

CSJ Number: 24 8 110 Federal Cost: $6,800,000
Project ID: 3082 State Cost: $5,237,000
County: Bexar Local Cost: $0
Roadway Name: US 90 Project Cost: $12,037,000
Limit From: At 36th Street intersection Let Date: 05/03
Limit To: Funding Category: 4 - State Connect
Project Description: Reconstruct intersection Completion Date: 04/05

CSJ Number: 24 8 115 Federal Cost: $0
Project ID: 3269 State Cost: $157,200
County: Bexar Local Cost: $0
Roadway Name: US 90 Project Cost: $157,200
Limit From: US 90 NE Frontage Road Let Date: 09/02
Limit To: SB IH 410 Entrance Ramp Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Rework Base, Seal Coat, ACP Overlay, & Pavement Markings Completion Date: 03/03

CSJ Number: 72 7 50 Federal Cost: $0
Project ID: 3342 State Cost: $73,000
County: Bexar Local Cost: $0
Roadway Name: IH 10 Project Cost: $73,000
Limit From: Bexar County Line EB Frontage Road Let Date: 01/03
Limit To: Boerne Stage Road Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal Coat and Pavement Markings Completion Date: 01/04

CSJ Number: 72 7 51 Federal Cost: $0
Project ID: 3343 State Cost: $59,000
County: Bexar Local Cost: $0
Roadway Name: IH 10 Project Cost: $59,000

Limit From: Bexar County Line WB Frontage Road Let Date: 01/03
Limit To: West of FM 3351 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal Coat and Pavement Markings Completion Date: 01/04

CSJ Number: 72 12 130 Federal Cost: $42,653,760
Project ID: 3236 State Cost: $10,663,440
County: Bexar Local Cost: $0
Roadway Name: IH 10 Project Cost: $53,317,200
Limit From: 0.2 Miles South of Crossroads Blvd. Let Date: 06/03
Limit To: Fulton Avenue Funding Category: 7 - Metro Mobility
Project Description: Upgrade to 10 Lane Freeway & Traffic Completion Date: 09/07
Management System

CSJ Number: 73 8 134 Federal Cost: $225,000
Project ID: 3175 State Cost: $25,000
County: Bexar Local Cost: $0
Roadway Name: IH 37 Project Cost: $250,000
Limit From: Fair Ave. S Let Date: 09/02
Limit To: SPRR Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Refurbish signs Completion Date: 11/03

CSJ Number: 73 8 140 Federal Cost: $0
Project ID: 3276 State Cost: $489,200
County: Bexar Local Cost: $0
Roadway Name: US 281 Project Cost: $489,200
Limit From: Rhapsody Drive Let Date: 01/03
Limit To: IH 410 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal Coat, ACP Overlay, & Pavement Completion Date: 08/03
Markings

CSJ Number: 73 9 24 Federal Cost: $72,000
Project ID: 3176 State Cost: $8,000
County: Bexar Local Cost: $0
Roadway Name: IH 37 Project Cost: $80,000
Limit From: SPRR Let Date: 09/02
Limit To: Loop 1604 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Refurbish signs Completion Date: 11/03

CSJ Number: 143 1 53 Federal Cost: $0
Project ID: 3333 State Cost: $1,500,000
County: Bexar Local Cost: $0
Roadway Name: US 87 Project Cost: $1,500,000
Limit From: FM 1516 Let Date: 09/02
Limit To: FM 1628 Funding Category: 1 - Prvnt Mnt/Rehab

Project Description: Base repair, surface treatment, overlay, pavement markings Completion Date: 09/03

CSJ Number: 143 2 22 Federal Cost: $0
Project ID: 3334 State Cost: $693,400
County: Bexar Local Cost: $0
Roadway Name: US 87 Project Cost: $693,400
Limit From: FM 1628 Let Date: 09/02
Limit To: Loop 1604 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Base repair & ACP overlay Completion Date: 09/03

CSJ Number: 253 4 119 Federal Cost: $0
Project ID: 3277 State Cost: $476,400
County: Bexar Local Cost: $0
Roadway Name: US 281 Project Cost: $476,400
Limit From: Bitters Road Let Date: 01/03
Limit To: Rhapsody Drive Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal Coat, ACP Overlay, & Pavement Markings Completion Date: 08/03

CSJ Number: 253 4 124 Federal Cost:
Project ID: 3299 State Cost: $200,000
County: Bexar Local Cost: $400,000
Roadway Name: US 281 Project Cost: $600,000
Limit From: At Borgfeld, Bulverde, Wilderness Oaks, Let Date: 09/02
Limit To: and Stone Oak Roads Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Signalizing intersections and traffic operations Completion Date: 12/03

CSJ Number: 291 9 125 Federal Cost: $180,000

Project ID: 3250 State Cost: $20,000
County: Bexar Local Cost: $0
Roadway Name: SH 16 Project Cost: $200,000
Limit From: 0.1 Mi N of Chimney Creek Road Let Date: 09/02
Limit To: 0.1 Mi S of Chimney Creek Road Funding Category: 11 - Distr Discretionary
Project Description: Install median barrier Completion Date: 08/03

CSJ Number: 470 2 10 Federal Cost: $0
Project ID: 3336 State Cost: $27,600
County: Bexar Local Cost: $0
Roadway Name: FM 1863 Project Cost: $27,600
Limit From: Comal County Line Let Date: 09/02
Limit To: Comal County Line Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: ACP overlay and pavement markings Completion Date: 12/03

CSJ Number: 521 1 40 Federal Cost: $4,610,236
Project ID: 1050 State Cost: $1,152,559
County: Bexar Local Cost: $0
Roadway Name: W.W. White Rd. (Loop 13) Project Cost: $5,762,795
Limit From: Seale Road Let Date: 10/02
Limit To: IH 10 Funding Category: 7 - Metro Mobility
Project Description: Widen existing 4 lane road to 4 lanes Completion Date: 08/04
w/ cont. left turn, sidewalks and drainage

CSJ Number: 521 4 243 Federal Cost: $129,150
Project ID: 3177 State Cost: $14,350
County: Bexar Local Cost: $0
Roadway Name: IH 410 Project Cost: $143,500
Limit From: US 90 Let Date: 09/02
Limit To: Callaghan Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Refurbish Signs Completion Date: 05/03

CSJ Number: 521 4 251 Federal Cost: $90,000
Project ID: 3186 State Cost: $10,000
County: Bexar Local Cost: $0
Roadway Name: IH 410 Project Cost: $100,000
Limit From: On westbound frontage Rd at Ingram Rd Let Date: 01/03
Limit To: Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Widen existing pavement to provide Completion Date: 07/03

right turn lane

CSJ Number: 521 4 253 Federal Cost: $492,750
Project ID: 3188 State Cost: $54,750
County: Bexar Local Cost: $0
Roadway Name: IH 410 Project Cost: $547,500
Limit From: NB and SB frontage Rd from US 90 Let Date: 01/03
Limit To: SH 151 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Planing, seal coat, asphaltic overlay, & pavement markings Completion Date: 08/03

CSJ Number: 521 5 116 Federal Cost: $50,850
Project ID: 3178 State Cost: $5,650
County: Bexar Local Cost: $0
Roadway Name: IH 410 Project Cost: $56,500
Limit From: 2.6 MI S of Valley Hi Dr, N Let Date: 09/02
Limit To: US 90 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Refurbish Signs Completion Date: 05/03

CSJ Number: 849 1 39 Federal Cost: $753,012
Project ID: 3124 State Cost: $188,253
County: Bexar Local Cost: $0
Roadway Name: Grissom/Culebra (FM 471) Project Cost: $941,265
Limit From: SH 16 Let Date: 08/03
Limit To: Loop 1604 Funding Category: 7 - Metro Mobility
Project Description: Construct sidewalks (East side of roadway only) Completion Date: 08/04

CSJ Number: 849 1 40 Federal Cost: $0
Project ID: 3270 State Cost: $1,378,500
County: Bexar Local Cost: $0
Roadway Name: Culebra Rd (FM 471) Project Cost: $1,378,500
Limit From: SH 16 Let Date: 09/02
Limit To: Loop 1604 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal Coat, ACP Overlay, & Pavement Markings Completion Date: 10/03

CSJ Number: 915 0 82 Federal Cost: $160,000

Project ID: 3273 State Cost: $40,000
County: Bexar Local Cost: $0
Roadway Name: Various Locations Project Cost: $200,000
Limit From: DISTRICTWIDE Let Date: 10/02
Limit To: Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Thermoplastic Re-striping (FY2002) – Completion Date: 10/03
Cat 10A

CSJ Number: 915 0 94 Federal Cost: $760,000
Project ID: 3345 State Cost: $190,000
County: Bexar Local Cost: $0
Roadway Name: Districtwide Traffic Management (FY 2 Project Cost: $950,000
Limit From: Various Let Date: 09/02
Limit To: - Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Districtwide Traffic Management Completion Date: 08/03
(FY 2002)

CSJ Number: 915 0 98 Federal Cost: $480,000
Project ID: 3292 State Cost: $120,000
County: Bexar Local Cost: $0
Roadway Name: Districtwide Project Cost: $600,000
Limit From: Non-site specific (2001) Let Date: 09/02
Limit To: Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Districtwide traffic signals (2001) Completion Date: 08/04

CSJ Number: 915 12 172 Federal Cost: $2,297,647
Project ID: 546 State Cost: $0
County: Bexar Local Cost: $574,412
Roadway Name: Houston St. Project Cost: $2,872,059
Limit From: Bowie Let Date: 12/02
Limit To: Pine Funding Category: 7 - Metro Mobility
Project Description: Reconstruct Existing Street Completion Date: 12/04

CSJ Number: 915 12 231 Federal Cost: $1,520,800
Project ID: 979 State Cost: $0
County: Bexar Local Cost: $380,200
Roadway Name: Bitters Project Cost: $1,901,000
Limit From: East of West Ave (W.of US 281) Let Date: 06/03
Limit To: East of Heimer (E. of US 281) Funding Category: 7 - Metro Mobility
Project Description: Widen narrow pavement for turn lanes Completion Date: 01/05

(signals)

CSJ Number: 915 12 281 Federal Cost: $2,412,800
Project ID: 2062 State Cost: $0
County: Bexar Local Cost: $603,200
Roadway Name: Southcross Blvd. Project Cost: $3,016,000
Limit From: S. New Braunfels Let Date: 06/03
Limit To: S. Presa St. Funding Category: 7 - Metro Mobility
Project Description: Reconstruct & expand from 2 to 4 lanes Completion Date: 01/05
(curbs, sidewalks, signals)

CSJ Number: 915 12 323 Federal Cost: $8,000
Project ID: 3033 State Cost: $0
County: Bexar Local Cost: $2,000
Roadway Name: Bicycle Route Street Map Project Cost: $10,000
Limit From: City Wide Let Date: 12/02
Limit To: Funding Category: 7 - Metro Mobility
Project Description: Map delineating existing bicycle facilities Completion Date: 07/03

CSJ Number: 915 12 328 Federal Cost: $1,644,962
Project ID: 3041 State Cost: $0
County: Bexar Local Cost: $411,241
Roadway Name: Isom Project Cost: $2,056,203
Limit From: Ramsey Let Date: 12/02
Limit To: US 281 Funding Category: 7 - Metro Mobility
Project Description: Reconstruct & widen narrow pavement Completion Date: 07/04
w/CLTL (sidewalks, drainage)

CSJ Number: 915 12 370 Federal Cost: $165,309
Project ID: 3146 State Cost: $0
County: Bexar Local Cost: $41,327
Roadway Name: Alamo Area Commute Solutions Prog. Project Cost: $206,636
Limit From: In San Antonio-Bexar Co. Area Let Date: 08/03
Limit To: Funding Category: 7 - Metro Mobility
Project Description: Operational costs for air quality program, Completion Date: 08/04
ridematching and carpool services

CSJ Number: 915 12 406 Federal Cost: $153,000
Project ID: 3371 State Cost: $17,000
County: Bexar Local Cost: $0
Roadway Name: Benton City Road Project Cost: $170,000
Limit From: @ UPRR DOT 764273E - 2002 FED RR Let Date: 01/03
Limit To: Funding Category: 8 - Safety
Project Description: Upgrade RR Crossing Warning Devices Completion Date: 10/03

CSJ Number: 1437 1 28 Federal Cost:
Project ID: 3204 State Cost: $2,757,300
County: Bexar Local Cost: $0
Roadway Name: Houston St. (FM 1346) Project Cost: $2,757,300
Limit From: FM 1516 Let Date: 05/03
Limit To: LP 1604 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Rehab & widen narrow pavement & shoulder Completion Date: 08/05

CSJ Number: 1741 2 27 Federal Cost: $0
Project ID: 3278 State Cost: $369,800
County: Bexar Local Cost: $0
Roadway Name: FM 2790 Project Cost: $369,800
Limit From: Loop 1604 Let Date: 01/03
Limit To: Medina River Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal Coat, ACP Overlay, & Pavement Markings Completion Date: 12/03

CSJ Number: 2104 2 26 Federal Cost: $0
Project ID: 3279 State Cost: $741,800
County: Bexar Local Cost: $0
Roadway Name: Potranco Rd. (FM 1957) Project Cost: $741,800
Limit From: Bexar/Medina County Line Let Date: 01/03
Limit To: Loop 1604 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal Coat, ACP Overlay, & Pavement Markings Completion Date: 12/03

CSJ Number: 2452 2 68 Federal Cost: $0
Project ID: 3280 State Cost: $1,431,900
County: Bexar Local Cost: $0
Roadway Name: Loop 1604 Project Cost: $1,431,900

Limit From: IH 10 (EBFR & WBFR) Let Date: 01/03
Limit To: US 281 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Seal Coat, ACP Overlay, & Pavement Completion Date: 08/03
Markings

CSJ Number: 2452 2 69 Federal Cost: $179,460
Project ID: 3251 State Cost: $19,940
County: Bexar Local Cost: $0
Roadway Name: Loop 1604 Project Cost: $199,400
Limit From: Kyle Seale Parkway Let Date: 09/02
Limit To: BabcocK Funding Category: 11 - Distr Discretionary
Project Description: Install median barrier Completion Date: 08/03

CSJ Number: 2452 3 91 Federal Cost: $0
Project ID: 3272 State Cost: $672,000
County: Bexar Local Cost: $0
Roadway Name: Loop 1604 Project Cost: $672,000
Limit From: Lower Seguin Road Let Date: 09/02
Limit To: IH 10 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Spot Base Repair & Overlay Completion Date: 12/03

CSJ Number: 2452 3 92 Federal Cost: $179,460
Project ID: 3252 State Cost: $19,940
County: Bexar Local Cost: $0
Roadway Name: Loop 1604 Project Cost: $199,400
Limit From: Green Mountain Road Let Date: 09/02
Limit To: UPRR Overpass Funding Category: 11 - Distr Discretionary
Project Description: Install median barrier Completion Date: 08/03

CSJ Number: 2452 4 9 Federal Cost:
Project ID: 3257 State Cost: $565,900
County: Bexar Local Cost: $0
Roadway Name: Loop 1604 Project Cost: $565,900
Limit From: FM 1518 Let Date: 09/02
Limit To: US 87 Funding Category: 1 - Prvnt Mnt/Rehab
Project Description: Rehabilitation & widen narrow pavement Completion Date: 12/03
& shoulders

CSJ Number: 5000 0 32 Federal Cost: $5,625,000
Project ID: 3406 State Cost: $0
County: Bexar Local Cost: $0
Roadway Name: Austin-San Antonio Corridor ProjectsProject Cost: $5,625,000
Limit From: Let Date:
Limit To: Funding Category: 2 Metro Corridor
Project Description: Proposed Engineering & Analytical Studies Completion Date:

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Completed FY 2003 Transit Projects

CSJ Number: N/A Federal Cost: $7,848,428
Project ID: 9001 State Cost: N/A
County: Bexar Local Cost: $1,962,107
Project Name: Revenue Vehicles Total Cost: $9,810,535
Project Description: Purchase Replacement Low Floor Buses Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $73,936
Project ID: 9005 State Cost: N/A
County: Bexar Local Cost: $18,484
Project Name: Non-Revenue Vehicles Total Cost: $92,420
Project Description: Purchase Service Vehicles Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $1,858,860
Project ID: 9007 State Cost: N/A
County: Bexar Local Cost: $464,715
Project Name: Facility Rehabilitation Total Cost: $2,323,575
Project Description: PE, final design, construction Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $172,000
Project ID: 9011 State Cost: N/A
County: Bexar Local Cost: $43,000
Project Name: Passenger Facilities Total Cost: $215,000
Project Description: Bus Stop Improvements Let Date: Varies
Funding Category: Section 5307 Completion Date: Varies

CSJ Number: N/A Federal Cost: $156,000

Project ID:	9012	State Cost:	N/A		
County:	Bexar	Local Cost:	$39,000		
Project Name:		Equipment	Total Cost:	$195,000	
Project Description:		MIS Hardware	Let Date:	Varies	
Funding Category:		Section 5307	Completion Date:	Varies	

CSJ Number:	N/A	Federal Cost:	$224,000		
Project ID:	9013	State Cost:	N/A		
County:	Bexar	Local Cost:	$56,000		
Project Name:		Equipment	Total Cost:	$280,000	
Project Description:		MIS Software	Let Date:	Varies	
Funding Category:		Section 5307	Completion Date:	Varies	
CSJ Number:	N/A	Federal Cost:	$51,648		
Project ID:	9015	State Cost:	N/A		
County:	Bexar	Local Cost:	$12,912		
Project Name:		Equipment	Total Cost:	$64,560	
Project Description:		Miscellaneous Equipment	Let Date:	Varies	
Funding Category:		Section 5307	Completion Date:	Varies	

Traffic Resignalization Emission Reduction Estimates

Of many projects shown in the MPO's TIP in this appendix, certain traffic signals for various intersections in the Bexar County have been separately evaluated for their impacts on the air quality and included in the Chapter 8 of the 2003 UPWP report. The results of this analysis would provide additional evidence indicating future lower ozone levels for the San Antonio area. The following pages present this evaluation.

Introduction

Traffic flow improvements have been used for air quality planning due to their ability to reduce traffic congestion, reducing congestion-related emissions, and are also a cost-effective method of reducing congestion and emissions.[1] Arterial management systems manage traffic by employing various detection and control devices along arterial roadways.

Traffic signalization is one of the most common traffic management techniques utilized in the United States. Signal control systems are methods of arterial roadway management is practiced because such control systems improve traffic flow as well as simplify system maintenance.[2] Some improvements can include:
Updating traffic signal hardware to utilize more modern technology, allowing for more sophisticated traffic flow strategies to be planned;
Timing traffic signals to correspond with current traffic flows, reducing unnecessary delays;
Coordinating and interconnecting signals to better interface pre-timed and traffic actuated signals, actively managed timing plans, and master controllers to minimize the number and frequency of stops necessary at intersections; and
Removing signals at intersections no longer requiring signalized stop control to reduce vehicle delays and unwarranted stops on the major street.[1]

The use of flexible traffic signal systems has been used since the early 1960's when computerized systems began to come into existence. Signalization projects can reduce carbon monoxide (CO) and hydrocarbon (HC) by reducing the number of vehicular stops and idling, which would reduce travel times and traffic delays. Reductions in fuel consumption have also been observed through traffic signal re-timing. Traffic flow at intersections can be improved in interconnection and coordination of signals.

Resignalization in Bexar County

The prospect of traffic signal retiming has been evaluated for various intersections in Bexar County in order to efficiently deal with the existing levels of traffic volumes. A program was recently conducted for Bexar County, as it is recommended that traffic signal timing patterns be checked and updated every 5 to 7 years. Such programs focus on three factors: 1) public benefit from improved traffic operation, 2) the inherent cost-effectiveness of operations improvements, and 3) establishing a baseline for measuring effectiveness in future re-timing projects.

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[1] MOSERS Handbook, June 2003. Texas Department of Transportation
[2] Miretek Systems, "Intelligent Transportation Systems Benefits: 2001 Update." Federal Highway Administration, June 2001.

Approximately seven traffic signal systems were assessed as to their benefit and functionality in handling traffic volume within the San Antonio area. Table K-8-1 lists the systems that were analyzed during the months of May 2001 to November 2001.

Table K-22. Traffic Signal Systems Evaluated

Traffic Signal Systems	
Wetmore System	Bandera System
Jones Maltsberger System	Rittiman System
Bitters/West System	Nacogdoches/Perrin Beitel System
Eisenhauer System	

Traffic Signal Evaluation

The evaluation of the selected traffic signal systems involved several steps. Traffic light systems in the San Antonio area were evaluated bv Pape-Dawson Engineers, Inc. The evaluation involved collection of data, design improvements, optimal timing plan development and implementation, and simulation of before and after conditions. Several models were used in the evaluation and assessment of the traffic signal systems. These models included TRANSYT-7F, Synchro 3.2, and PASSER II.

Information on arterial data, "before" signal timing data, saturation flow rates, and speed/travel time data were gathered through various sources. Traffic volumes, which are the numbers of vehicles that pass a specific point during a given period of time, were collected at the intersections.[3] Lane configuration, link speed data, and link distance information were provided by the City of San Antonio. The data gathered for model input was first run through Synchro 3.2 to produce a simulation file. The file was calibrated to reflect specific "before" conditions and then converted to a TRANSYT-7F file. The TRANSYT-7F analyzed the traffic system and produced a "before" traffic flow simulation.

The simulation data originally provided by Synchro 3.2 was then modified to reflect optimal time cycles for improved efficiency. PASSER II analyzed alternative phasing arrangements and cycle lengths. The cycle lengths that generated the least amount of delay were deemed most efficient and thus recommended. The following sections describe the arterial intersections that were analyzed and the recommended timing plans.

Wetmore System

The Wetmore System is located on Wetmore Road, which is classified as a primary arterial, Type A. In evaluating this system, three timing plans were developed for the A.M Peak, Midday/Off Peak, and P.M. Peak periods. Four intersections were analyzed on the Wetmore System and their operation is detailed in Table K- 8-2.[4]

[3] "Detection Technology: For IVHS-Volume 1: Final Report Addendum." July 1995. http://ntl.bts.gov/DOCS/96100/ch02/body_ch02_03.html

[4] Traffic Signal Re-Timing Study, "Wetmore System Technical Memorandum." Pape Dawsom Engineers, May 2001.

Table K-23. Intersections Evaluated for Traffic Signal Re-Timing on Wetmore Rd.

Signalization Details		
Before Conditions		
Intersection Name	Operation	No. of Phases
Wetmore Rd. & Ridge Country	Coordinated	4
Wetmore Rd. & Gunn Sports Park	Coordinated	4
Wetmore Rd. & Wurzbach Pkwy West	Coordinated	4
Wetmore Rd. & Wurzbach Pkwy East	Coordinated	4
After Conditions		
Intersection Name	Operation	No. of Phases
Wetmore Rd. & Ridge Country	Coordinated	4
Wetmore Rd. & Gunn Sports Park	Coordinated	4
Wetmore Rd. & Wurzbach Pkwy West	Coordinated	4
Wetmore Rd. & Wurzbach Pkwy East	Coordinated	4

The Wetmore System was evaluated as described in Traffic Signal Evaluation. Analysis of the evaluation provided cycles that would improve efficiency in a number of areas. These areas include bandwidth efficiency, vehicle delay, and fuel consumption.

The 115 second cycle for the AM peak hour was selected since it provided the best bandwidth efficiency, largest bands for northbound and southbound traffic, and had a lower delay value. The 75 second cycle for off peak hours is the lowest delay for the arterial. The 80 second cycle for the PM peak hour had a high bandwidth efficiency, lowest delay, and the lowest fuel consumption.

Eisenhauer System

The Eisenhauer System is located on Eisenhauer Road and is designated as a secondary arterial, Type A, east of Interstate 35 and Type B, west of Interstate 35. Three timing plans were developed for the A.M. Peak, Midday/Off Peak, and P.M. Peak periods. Nine intersections were evaluated, as listed in Table K- 8-3.[5]

Table K-24. Evaluated Intersections on Eisenhauer Rd

Signalization Details		
Before Conditions		
Intersection Name	Operation	No. of Phases
Eisenhauer and Corrine	Uncoordinated	2
Eisenhauer and Holbrook	Uncoordinated	2
Eisenhauer and Harlow	Uncoordinated	2
Eisenhauer and Kingston	Uncoordinated	2
Eisenhauer and Molokai	Uncoordinated	2
Eisenhauer and Interstate 35 Diamond	Uncoordinated	TTI 4 Phase

[5] Traffic Signal Re-Timing Study, "Eisenhauer System Technical Memorandum." Pape Dawsom Engineers, November 2001.

Eisenhauer and Fratt	Uncoordinated	5
Eisenhauer and Ray Bon	Uncoordinated	8
Eisenhauer and Mid Crown	Uncoordinated	6
After Conditions		
Intersection Name	Operation	No. of Phases
Eisenhauer and Corrine	Coordinated	2
Eisenhauer and Holbrook	Coordinated	2
Eisenhauer and Harlow	Coordinated	2
Eisenhauer and Kingston	Coordinated	2
Eisenhauer and Molokai	Coordinated	2
Eisenhauer and Interstate 35 Diamond	Coordinated	TTI 4 Phase
Eisenhauer and Fratt	Coordinated	5/2
Eisenhauer and Ray Bon	Coordinated	8/2
Eisenhauer and Mid Crown	Coordinated	6/2

The Eisenhauer System was evaluated as described in Traffic Signal Evaluation. Analysis of the evaluation provided cycles that would improve efficiency in a number of areas. These areas include bandwidth efficiency, vehicle delay, and fuel consumption. The AM peak hour's cycle was chosen to be 120 seconds since it provided the best bandwidth efficiency and largest bands for northbound and southbound traffic. The cycle also coincided with low values of delay and low fuel consumption. The 90 second cycle was recommended for the system during off peak hours. This cycle provided the lowest delay at the I-35 diamond interchange.

Bitters/West System

The Bitters/West System is located on Bitters Road and West Avenue. Bitters Road is a Type A secondary arterial. West Avenue is a Type A arterial and meets Bitters. Three timing plans were developed for the A.M. Peak, Midday/Off Peak, and P.M. Peak periods. Six intersections were evaluated, as listed in Table K-8-4.[6]

Table K-25. Intersections Evaluated for Traffic Signal Re-Timing on Bitters/West

Signalization Details		
Before Conditions		
Intersection Name	Operation	No. of Phases
Bitters Road and Heimer Road	Uncoordinated	7
Bitters Road and US 281	Uncoordinated	TTI 4 Phase
Bitters Road and Embassy Row	Uncoordinated	4
Bitters Road and West Avenue	Uncoordinated	5
West Avenue and Embassy Oaks	Uncoordinated	2
West Avenue and Interpark Blvd	Uncoordinated	4
After Conditions		

[6] Traffic Signal Re-Timing Study, "Bitters/West System Technical Memorandum." Pape Dawsom Engineers, October 2001.

Intersection Name	Operation	No. of Phases
Bitters Road and Heimer Road	Uncoordinated	7
Bitters Road and US 281	Uncoordinated	TTI 4 Phase
Bitters Road and Embassy Row	Uncoordinated	4
Bitters Road and West Avenue	Uncoordinated	5
West Avenue and Embassy Oaks	Uncoordinated	2
West Avenue and Interpark Blvd	Uncoordinated	4

The Bitters/West System was evaluated as described in Traffic Signal Evaluation. Analysis of the evaluation provided cycles that would improve efficiency in a number of areas. These areas include bandwidth efficiency, vehicle delay, and fuel consumption.

The best cycle for the A.M. peak hour was 108 seconds. It provided the best bandwidth efficiency and low delay. A cycle length of 90 seconds for off peak hours yielded low delay but were the lowest in effectiveness of all categories. For P.M. peak hours, the 120 second cycle length provided high bandwidth efficiency, low fuel consumption, and low delay values.

Bandera System

The Bandera System is on Bandera Road, which is designated as a primary arterial, Type A. The lanes on Bandera Road vary from six-lanes with exclusive left turn lanes to a four-lane roadway with exclusive right and left turn lanes. Three timing plans were developed for the A.M. Peak, Midday/Off peak, and P.M. Peak periods. Eight intersections were evaluated on Bandera Road, as listed in Table K-8-5.[7]

Table K-26: Intersections Evaluated for Traffic Signal Re-Timing on Bandera Rd

Signalization Details		
Before Conditions		
Intersection Name	Operation	No. of Phases
Bandera and Prue/Tezel	Coordinated	6
Bandera and Old Prue/Camino Villa	Coordinated	6
Bandera and Braun	Coordinated	5
Bandera and Mystic Park/Bresnahan	Coordinated	6
Bandera and Guilbeau/Bristle Cone	Coordinated	6
Bandera and Mainland	Coordinated	6
Bandera and Eckhert	Coordinated	6
Gilbeau and Mystic Park	Free/Coordinated	3
After Conditions		
Intersection Name	Operation	No. of Phases
Bandera and Prue/Tezel	Coordinated	6
Bandera and Old Prue/Camino Villa	Coordinated	6

[7] Traffic Signal Re-Timing Study, "Bandera System Technical Memorandum." Pape Dawsom Engineers, June 2001.

Bandera and Braun	Coordinated	5
Bandera and Mystic Park/Bresnahan	Coordinated	6
Bandera and Guilbeau/Bristle Cone	Coordinated	6
Bandera and Mainland	Coordinated	6
Bandera and Eckhert	Coordinated	6
Gilbeau and Mystic Park	Coordinated	3

The Bandera System was evaluated as described in Traffic Signal Evaluation. Analysis of the evaluation provided cycles that would improve efficiency in a number of areas. These areas include bandwidth efficiency, vehicle delay, and fuel consumption.

For the A.M. peak hour, a cycle of 130 seconds was chosen due to good bandwidth efficiencies. The 90 second cycle was recommended for off peak hours since it provided a low delay time. The P.M. peak hour was recommended the 130 second cycle length due to high bandwidth efficiency, low delay, and low fuel consumption.

Rittiman System

Rittiman Road is designated a secondary arterial, Type A east of I-35 and Type B, west of I-35. Rittiman road is a four lane roadway with a diamond interchange at the intersection with Interstate 35. Three timing plans were developed for the A.M. Peak, Midday/Off peak, and P.M. Peak periods. Table K-8-6 lists the five intersections that were evaluated on this system.[8]

Table K-27. Intersections Evaluated for Traffic Signal Re-Timing on Rittiman

Signalization Details		
Before Conditions		
Intersection Name	Operation	No. of Phases
Rittiman Rd and Rittiman Plaza	Uncoordinated	2
Rittiman Rd and Fairdale	Uncoordinated	2
Rittiman Rd and IH 35 Diamond	Uncoordinated	TTI 4 Phase
Rittiman Rd and Goldfield	Uncoordinated	2
Rittiman Rd and Fratt/Business Park	Uncoordinated	8
After Conditions		
Intersection Name	Operation	No. of Phases
Rittiman Rd and Rittiman Plaza	Coordinated	2
Rittiman Rd and Fairdale	Coordinated	2
Rittiman Rd and IH 35 Diamond	Coordinated	TTI 4 Phase
Rittiman Rd and Goldfield	Coordinated	2
Rittiman Rd and Fratt/Business Park	Coordinated	8

[8] Traffic Signal Re-Timing Study, "Rittiman System Technical Memorandum." Pape Dawsom Engineers, November 2001.

The Rittiman System was evaluated as described in Traffic Signal Evaluation. Analysis of the evaluation provided cycles that would improve efficiency in a number of areas. These areas include bandwidth efficiency, vehicle delay, and fuel consumption.

For the A.M. peak hour, the 120 second cycle was bandwidth efficient and had the lowest delay values. The 90 second cycle for the off peak period allows low delay at the diamond interchange as well as along the arterial. The 120 second cycle was also recommended for the PM peak hour due to it high bandwidth efficiency, low delay, and low fuel consumption.

Jones-Maltsberger System

Jones-Maltsberger is a secondary arterial, Type A and has four lanes. Three timing plans were developed for the A.M. Peak, Off Peak, and P.M. Peak periods. Five intersections were evaluated on Jones-Maltsberger, which are listed on Table K-8-7.[9]

Table K-28. Intersections Evaluated for Traffic Signal Re-Timing on Jones-Maltsberger

Signalization Details		
Before Conditions		
Intersection Name	Operation	No. of Phases
Jones Maltsberger and Starcrest	Free	8
Jones Maltsberger and Perennial/Budding	Free	6
Jones Maltsberger and Money Tree	Free	5
Jones Maltsberger and Burning Trail	Free	5
Jones Maltsberger and Thousand Oaks	Free	8
After Conditions		
Intersection Name	Operation	No. of Phases
Jones Maltsberger and Starcrest	Coordinated	8
Jones Maltsberger and Perennial/Budding	Coordinated	6
Jones Maltsberger and Money Tree	Coordinated	5
Jones Maltsberger and Burning Trail	Coordinated	5
Jones Maltsberger and Thousand Oaks	Coordinated	8

The Jones-Maltsberger System was evaluated as described in Traffic Signal Evaluation. Analysis of the evaluation provided cycles that would improve efficiency in a number of areas. These areas include bandwidth efficiency, vehicle delay, and fuel consumption.

The best cycle for the A.M. peak period was one that consisted of 90 seconds since it had the best bandwidth efficiency and low delay. A cycle of 120 seconds was optimal for off peak. A good candidate for the P.M. peak period would be a cycle of 115 seconds since it had good bandwidth efficiency, low fuel consumption, and low delay values.

Nacogdoches/Perrin Beitel System

[9] Traffic Signal Re-Timing Study, "Jones-Maltsberger System Technical Memorandum." Pape Dawsom Engineers, May 2001.

Both Nacogdoches and Perrin Beitel are Type A secondary arterial, each being a four-lane roadway. Twenty intersections were evaluated on the Nacogdoches/Perrin Beitel system, as detailed on Table K-8-8. Three timing plans were developed for the A.M. Peak, Off Peak, and P.M. Peak periods.[10]

Table K-29: Intersections Evaluated for Traffic Signal Re-Timing on Nacogdoches/Perrin Beitel

Signalization Details		
Before Conditions		
Intersection Name	Operation	No. of Phases
Nacogdoches and Topperwien	Coordinated	4
Nacogdoches and Judson	Coordinated	8
Nacogdoches and Dreamwood	Coordinated	3
Nacogdoches and O'Connor	Coordinated	8
Nacogdoches and El Charro	Coordinated	2/3*
Nacogdoches and Higgins	Coordinated	3
Nacogdoches and El Sendero	Coordinated	4
Nacogdoches and Bell	Coordinated	3
Nacogdoches and Leonhardt	Coordinated	5
Nacogdoches and Thousand Oaks	Coordinated	8
Perrin Beitel and Naco-Perrin	Coordinated	6
Perrin Bietel and El Sendero	Coordinated	3
Perrin Beitel and Wurzbach Parkway	Coordinated	TTI 4 Phase
Perrin Beitel and Perrin Central	Coordinated	5
Perrin Beitel and Post Office	Coordinated	3
Perrin Beitel and Clear Spring	Coordinated	3
Perrin Beitel and Comstock	Coordinated	5
Perrin Beitel and Center Gate	Coordinated	3
Thousand Oaks and Bulverde	Coordinated	5
Thousand Oaks and Uhr	Coordinated	2
After Conditions		
Intersection Name	Operation	No. of Phases
Nacogdoches and Topperwien	Coordinated	4
Nacogdoches and Judson	Coordinated	8
Nacogdoches and Dreamwood	Coordinated	3
Nacogdoches and O'Connor	Coordinated	8
Nacogdoches and El Charro	Coordinated	2/3*
Nacogdoches and Higgins	Coordinated	3
Nacogdoches and El Sendero	Coordinated	4
Nacogdoches and Bell	Coordinated	3
Nacogdoches and Leonhardt	Coordinated	5
Nacogdoches and Thousand Oaks	Coordinated	8
Perrin Beitel and Naco-Perrin	Coordinated	6
Perrin Beitel and El Sendero	Coordinated	3

[10] Traffic Signal Re-Timing Study, "Nacogdoches/Perrin Beitel System Technical Memorandum." Pape Dawsom Engineers, November 2001.

Perrin Beitel and Wurzbach Parkway	Coordinated	TTI 4 Phase
Perrin Beitel and Perrin Central	Coordinated	5
Perrin Beitel and Post Office	Coordinated	3
Perrin Bietel and Clear Spring	Coordinated	3
Perrin Beitel and Comstock	Coordinated	5
Perrin Beitel and Center Gate	Coordinated	3
Thousand Oaks and Bulverde	Coordinated	5
Thousand Oaks and Uhr	Coordinated	2

The Nacogdoches/Perrin Beitel System was evaluated as described in Traffic Signal Evaluation. Analysis of the evaluation provided cycles that would improve efficiency in a number of areas. These areas include bandwidth efficiency, vehicle delay, and fuel consumption.

The 90 second cycle for the AM peak hour was selected since it provided the one of the best bandwidth efficiencies, large bands for northbound and southbound traffic, and lowest combination of delay values. Off peak period was recommended the 90 second cycle. It presented the lowest delay and low fuel consumption. The 130 second cycle length for PM peak hour had high bandwidth efficiency, low delay, and low fuel consumption.

In summary, the traffic signal systems included in this study were recommended to have cycle lengths reduced while maintaining efficient bandwidth, reduced vehicle delays, and reduced fuel consumption. Table K-8-9 details the various traffic signal systems included in the study as well as data on vehicle stop frequency, vehicle delay, and fuel consumption.

Table K-30. Traffic Signal System Statistics before & with Recommended Improvements

Traffic Signal System		Number of Hours	Stops		Total System Delay		Fuel Consumption	
			Before	After	Before	After	Before	After
Wetmore	AM	2.33	7814	6244	61	37	221	190
	Off Peak	7.5	3040	2550	20	14	105	94
	PM	2	4471	4510	32	26	166	160
Eisenhauer	AM	2	17195	14734	677	525	773	655
	Off Peak	7	13207	2787	112	24	331	81
	PM	2	18224	14552	543	384	725	585
Bitters/West	AM	2	16464	12664	329	281	454	431
	Off Peak	7	14761	15872	613	472	620	600
	PM	2	40344	22853	2463	868	2065	979
Bandera	AM	1.25	31743	24221	834	724	1474	1300
	Off Peak	6.5	17108	14290	132	110	732	624
	PM	3.75	60293	29076	3640	738	3625	1406
Rittiman	AM	2	19116	11822	702	412	1192	552
	Off Peak	7	7048	5270	55	40	222	203
	PM	2	17651	15939	1380	663	1295	759
Jones-Maltsberger	AM	2	8356	8069	82	66	381	334
	Off Peak	7	6697	6168	71	64	314	283
	PM	2	14926	11797	246	175	596	487
Nacogdoches/Perrin Beitel	AM	1.5	25721	22211	201	179	834	783
	Off Peak	7	23273	21934	163	157	801	785
	PM	3	47198	37977	793	760	1626	1513

On-Road Emission Reduction

According to the 1999 AACOG Emission Inventory, on-road sources provides a substantial amount of VOC and NOx emissions to Bexar County. The 2007 projection of the September photochemical modeling episode accounts for the updated MOBILE6 on road emissions and it is against these emissions that the proposed traffic signal timing cycle improvements were performance evaluated. Average weekday (Monday-Friday) emissions for on-road sources in Bexar County are 61 tons/day of NOx and 49 tons/day of VOC[11].

The "Traffic Signal Re-Timing Study"[12] reports describing the evaluations and timing cycle recommendations of the traffic signal systems were not consistent in detailing

[11] See Chapter 4 for the methodology to calculate on-road emissions in 2007 projection and Table k- 4.3 and 4.4 for complete on-road emission data.

[12] "Traffic Signal Re-Timing Study," Pape Dawson Engineers Inc. May 2001-November 2001.

correct delay values and provided confusing details. The purpose of this report was to evaluate the proposed signal timing improvements for the areas under study as well as their potential emission reduction. It was concluded after much analysis that analyzing the increase or decrease of total delay time the vehicles experienced during the before and after traffic flow simulations would be the more suitable approach. The difference of the total delay times was multiplied by an emission factor for idling vehicles.

The idling emission factor was utilized since vehicles idle while being delayed at traffic light stops. MOBILE6 provided the emission factor for a vehicle speed of 2.5 miles per hour. A speed of 2.5 miles per hour was used because it was the slowest speed that mobile6 model can calculate emissions. All the other factors for the mobile6 model (temperature, RVP and Sulfur levels, VMT Mix, etc.) used local data input[13]. For the Mobile idling emissions, VOC was 7.03 grams/mile and NOx was 2.17 grams/mile. Once the idling emissions factor was estimated, the result was applied to each intersection. The equation for calculating emissions reductions per hour is:

(Total Delay Time Before per hour – Total Delay Time After per hour) x Mobile6 Idling Emission Factor = Emission Reductions per hour

The delay times were evaluated for 3 time periods: AM Peak, PM Peak, and Off Peak. The AM peak, PM peak, and Off Peak hours varied for each traffic signal system. For example, AM peak periods varied between 1.25 hours and 3.75 hours. These time frames are listed in Table K-8-9 for each intersection involved in the study. The emissions (grams/hr) were multiplied by the number of hours in the respective time period to result in the total emission reduction per time period. The total emissions in grams/day were then converted to pounds/day.

(Total Emissions grams/day x 2.205) /1000 = Total Emissions lbs/day

The following tables and figures illustrate the emission reductions for the traffic signal systems with the implementation of recommended timing cycles.

Wetmore System Emission Reductions

AM peak period reductions were significant on a per hour scale than the off peak period reductions for the Wetmore system. An average reduction of 1.1 lbs/hr was observed in the AM peak hours compared to an average of 0.2 lbs/hr of VOC idling emissions was reduced in the off peak hours by the recommended timing plans.

PM peak only had an emissions reduction of approximately 0.24 lbs/hr. The PM period for idling NOx emissions had the most significant emission reduction of the periods included in the study, based per hour. The PM peak period had a reduction of 0.72 lbs/hr while the AM peak period had a reduction of 0.33 lbs/hr and the off peak period had a reduction of 0.08 lbs/hr.

Table K-31 list the emissions reductions by time period, while figures K-1 and K-2 graphically compare the before and after case. Overall VOC emissions decrease 4

[13] See UPWP 3.8, 2003 "Analysis of On-Road Control Strategies and Alternative Fuels for San Antonio Metropolitan Statistical Area September 13-20, 1999 Modeling Episode" (unpublished report) for a complete description of the Moble6 model and the data inputs used.

lbs/day and NOx emissions decreased 1.3 lbs/day. This system had the smallest reduction in VOC and NOx emissions among the seven systems analyzed.

Table K-31. Idling VOC and NOx Emission for the Wetmore Traffic System, lbs/day

Time Period	VOC		NOx		Percent Change (VOC&NOx)
	Before	After	Before	After	
AM Peak	5.51	3.34	1.70	1.03	-39.33%
Off Peak	5.81	4.07	1.79	1.25	-30.00%
PM Peak	2.48	2.02	0.76	0.62	-18.72%
Total	13.80	9.43	4.25	2.90	-31.69%

Figure K-1. Idling VOC Emissions before and after New Timing Cycle Implementation on the Wetmore System

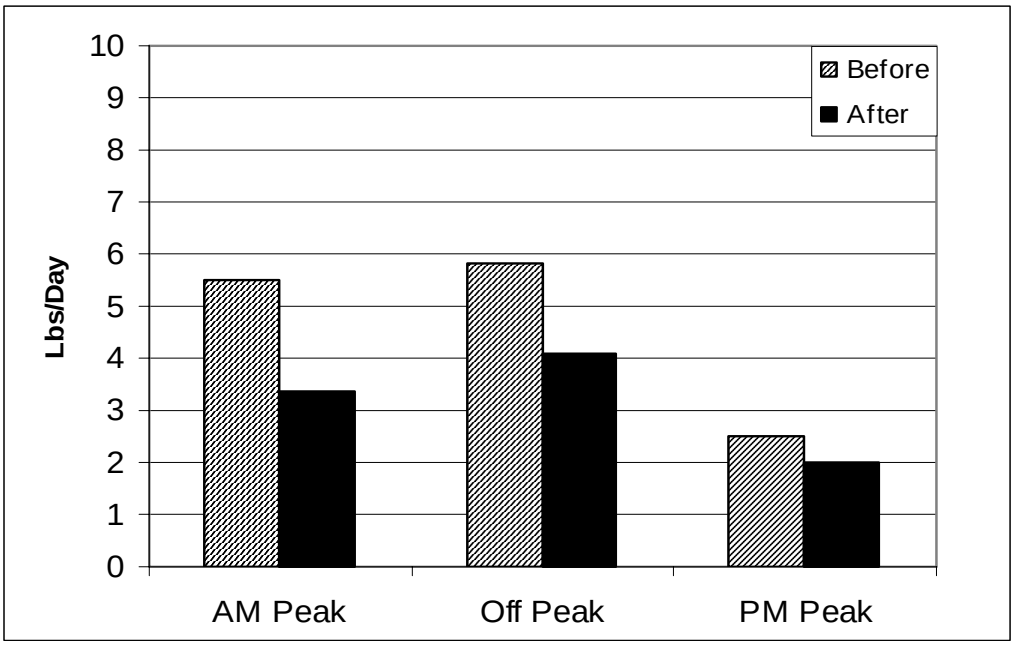
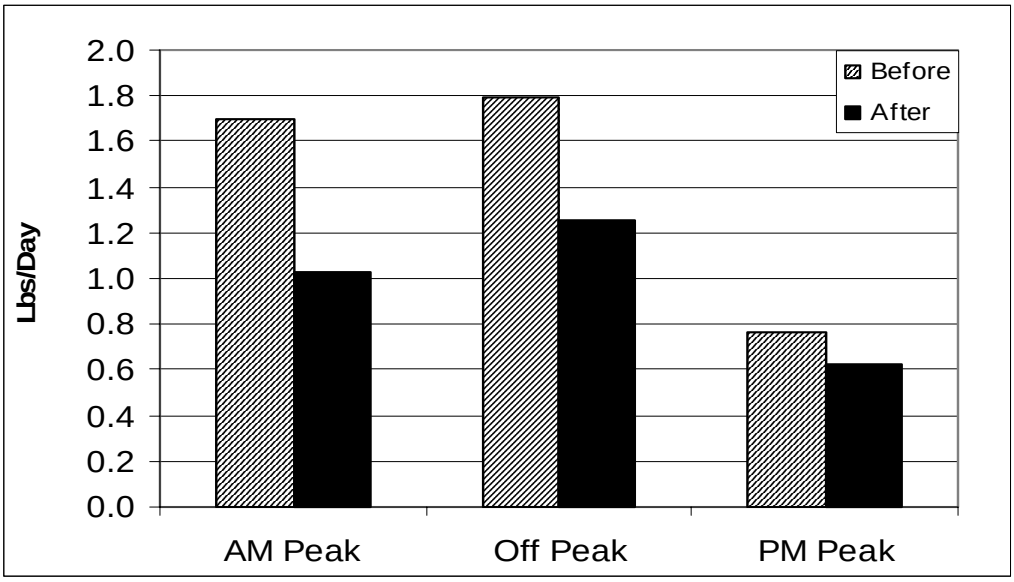


Figure K-2. Idling NOx Emissions before and after New Timing Cycle Implementation on the Wetmore System



Eisenhauer System Emissions Reductions

The recommended timing cycles for the Eisenhauer traffic signal system provided a constant reduction in idling VOC emissions. The AM peak, off peak, and PM peak idling VOC emission reduction on a per hour basis is about 6 lbs/hr. The cycles reduced idling NOx emissions at almost the same constancy as the idling VOC reductions, reducing AM peak and PM peak idling NOx emission reductions by about 2 lbs/hr and off peak idling NOx emission reduction by 1 lb/hr.

Table K-32 shows the emissions reductions for the 3 time periods. Also, Figures K-3 and K-4 provide VOC and NOx bar charts of the before and after the traffic re-signalization. Compared to the Off-Peak time of the other traffic light systems, this system had the greatest percentage reductions for the off peak period.

Table K-32. Idling VOC and NOx Emissions for the Eisenhauer Traffic Signal System, lbs/day

Time Period	VOC		NOx		Percent Change (VOC&NOx)
	Before	After	Before	After	
AM Peak	52.48	40.70	16.16	12.53	-22.45%
Off Peak	30.39	6.51	9.36	2.01	-78.57%
PM Peak	42.09	29.77	12.96	9.17	-29.28%
Total	124.96	76.98	38.47	23.70	-38.40%

Figure K-3. Idling VOC Emissions before and after New Timing Cycle Implementation on the Eisenhauer System

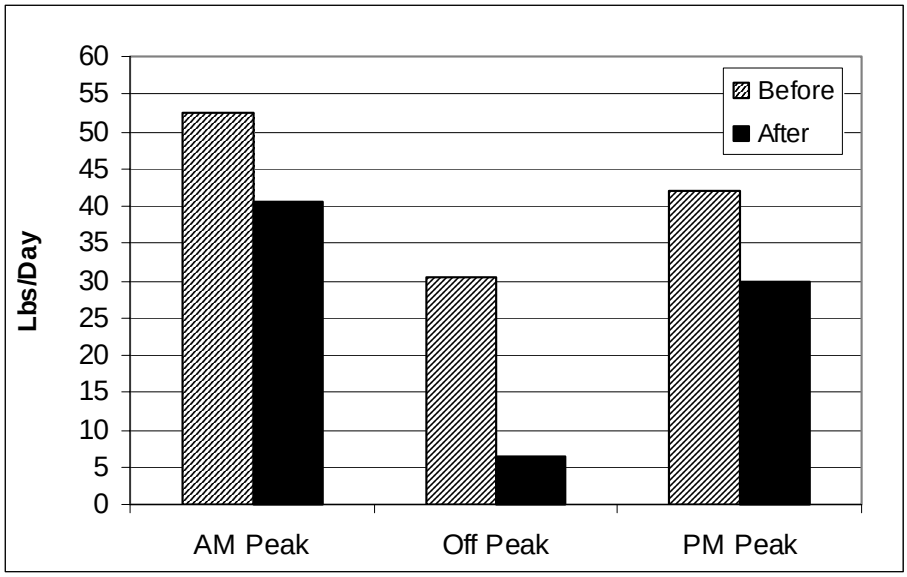
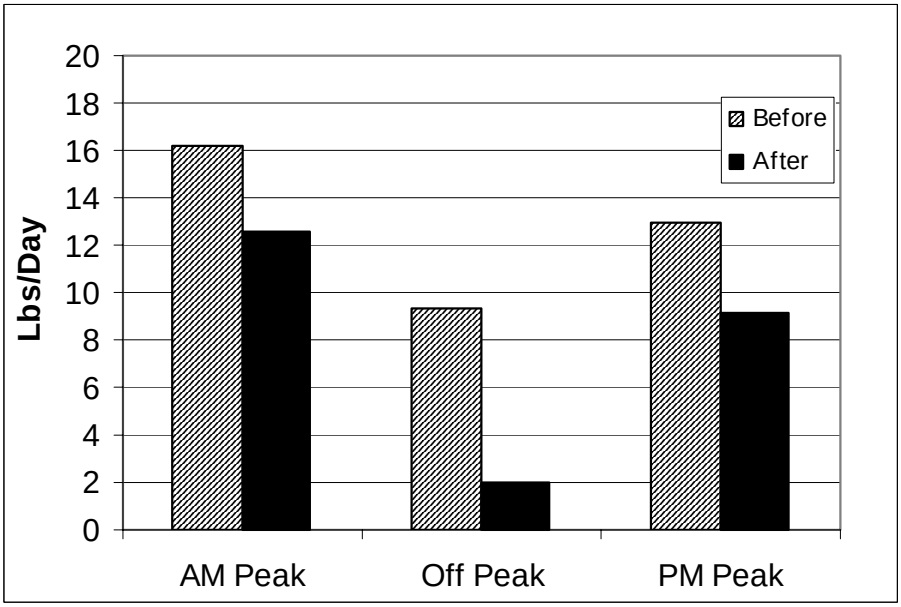


Figure K-4. Idling NOx Emissions before and after New Timing Cycle Implementation on the Eisenhauer System



Bitters/West Emission Reduction

The recommended timing cycles for the Bitters/West system reduced emissions during the time periods under study, with some reductions being more than others. Idling VOC emissions during the AM peak period were reduced on average by 2 lbs/hr. Off peak

idling VOC emissions were reduced by 6 lbs/hr and PM peak idling VOC emissions were reduced by approximately 60 lbs/hr. Regarding reductions in idling NOx emissions, emissions were reduced in all three time periods with PM reductions being more significant than the other two periods. Idling NOx emissions were reduced by about 0.5 lbs/hr during the AM peak period and 2 lbs/hr during the off peak period. The idling NOx emission reduction during the PM peak period was observed at 19 lbs/hr.

As listed in Table K-33, overall VOC emissions were reduced by 166 lbs/day and NOx emissions were reduced 51 lbs/day. This represents the second greatest total reduction of all the single systems studied. The results are graphically display in Figures K-5 and K-6.

Table K-33. Idling VOC and NOx Emission for the Bitters/West Traffic Signal System, lbs/day

Time Period	VOC		NOx		Percent Change (VOC&NOx)
	Before	After	Before	After	
AM Peak	25.50	21.78	7.85	6.71	-14.58%
Off Peak	166.32	128.06	51.21	39.43	-23.00%
PM Peak	190.93	67.29	58.79	20.72	-64.76%
Total	382.76	217.14	117.85	66.85	-43.27%

Figure K-5. Idling VOC Emissions before and after New Timing Cycle Implementation on the Bitters/West System

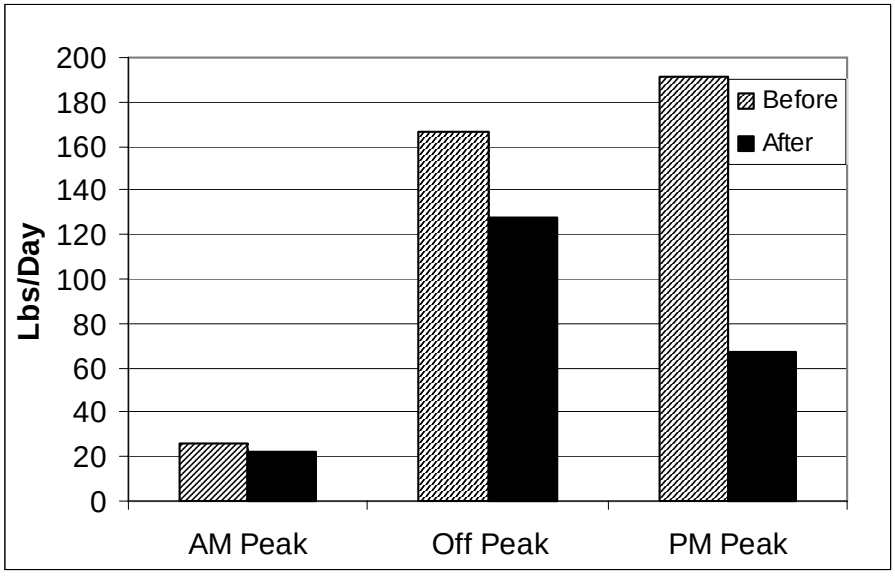
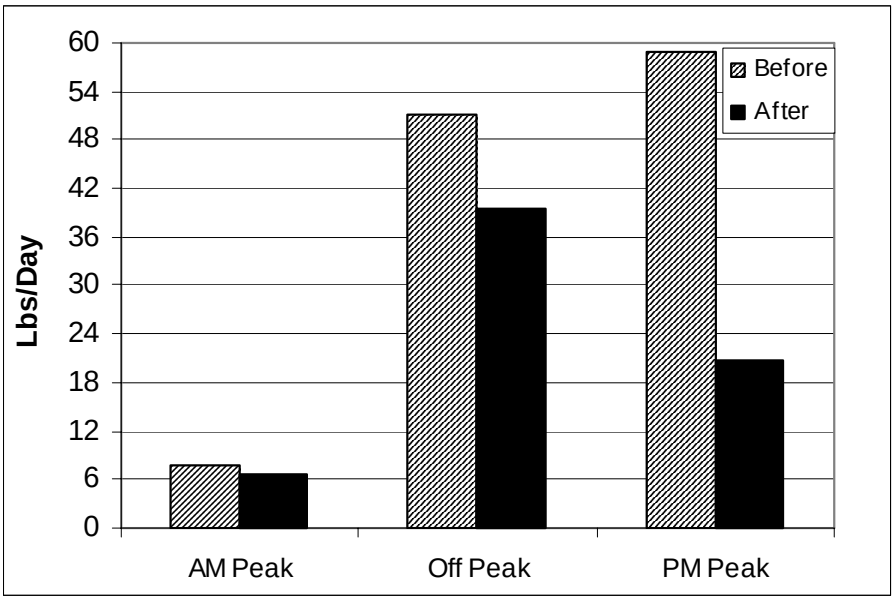


Figure K-6. Idling NOx Emissions before and after New Timing Cycle Implementation on the Bitters/West System



Bandera Emission Reduction

The timing cycle implemented on the Bandera traffic system reduced idling emissions. The emission reduction of idling VOC precursors was 1 lb/hr and 2 lbs/hr during the off peak period and AM peak period, respectively. The idling emission reduction for the PM peak period is significantly higher with a reduction of 200 lbs/hr.

Listed in Table K-34 are the VOC and NOx emissions reductions for each other the three time periods for this system. As expected, this intersection had the greatest reduction in VOC (433lbs) and NOx (133lbs) emissions. This system also had the highest percentage reduction in emissions too. The dramatic drops in emissions are shown in figures K-7 and K-8.

Table K-34. Idling VOC and NOx Emissions for the Bandera Traffic Signal System, lbs/day

Time Period	VOC		NOx		Percent Change (VOC&NOx)
	Before	After	Before	After	
AM Peak	40.41	35.08	12.44	10.80	-13.19%
Off Peak	33.26	27.71	10.24	8.53	-16.66%
PM Peak	529.08	107.27	162.90	33.03	-79.73%
Total	602.74	170.06	185.58	52.36	-71.79%

Figure K-7. Idling VOC Emissions before and after New Timing Cycle Implementation on the Bandera System

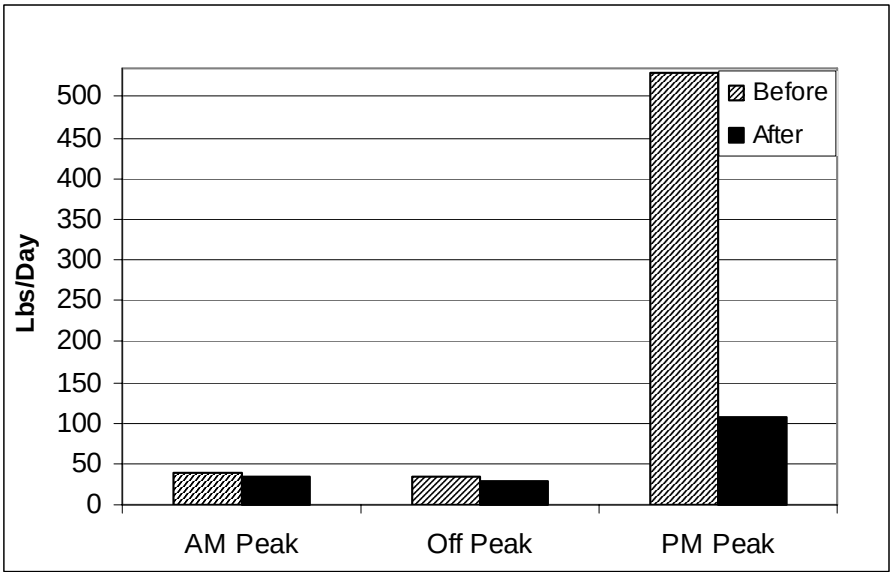
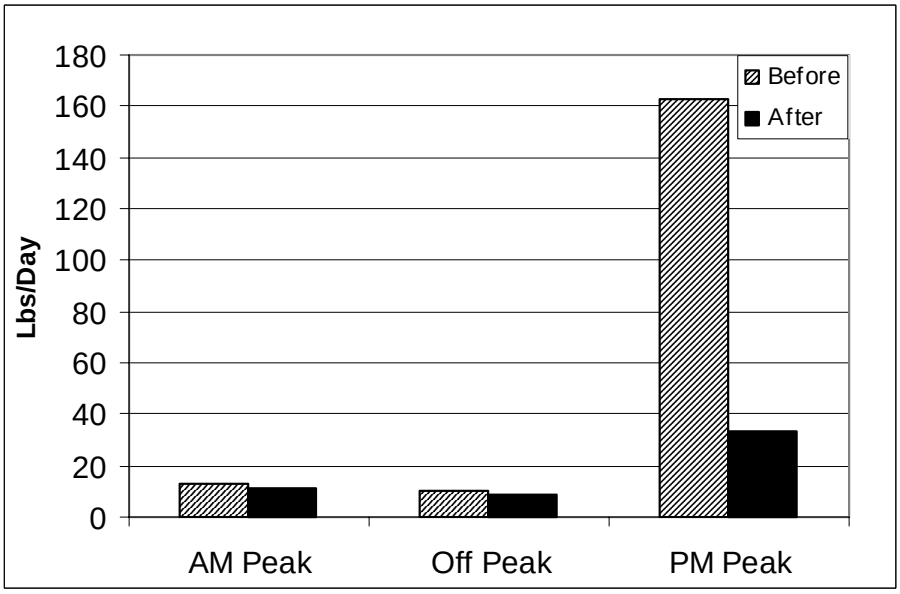


Figure K-8. Idling NOx Emissions before and after New Timing Cycle Implementation for the Bandera System



Rittiman Emission Reduction

For the Rittiman traffic signal system, VOC and NOx emission reductions are significant during the PM peak hour periods than the AM peak periods or the off peak periods. The VOC reduction for the PM peak period was 27 pounds per hour. The AM peak had a reduction of 11 pounds per hour and off peak had a reduction of 0.5 pounds her hour. NOx emissions were reduced by 8 pounds per hour during the PM peak period. The AM

peak period had a reduction of 3.5 pounds per hour and the off peak period had a reduction of 0.2 pounds per hour.

Overall, there was a reductions of 82lbs of VOC and 25 lbs reduction in NOx (Table K-35). This represented the second highest overall percentage reduction at 47%. Figures K-9 and K-10 graphically displays the results for VOC and NOx reductions.

Table K-35. Idling VOC and NOx Emission Reductions for the Rittiman Traffic Signal System, lbs/day

Time Period	VOC		NOx		Percent Change (VOC&NOx)
	Before	After	Before	After	
AM Peak	54.42	31.94	16.76	9.83	-41.31%
Off Peak	14.92	10.85	4.60	3.34	-27.29%
PM Peak	106.98	51.40	32.94	15.82	-51.96%
Total	176.32	94.19	54.29	29.00	-46.58%

Figure K-9. Idling VOC Emissions before and after New Timing Cycle Implementation on the Rittiman System

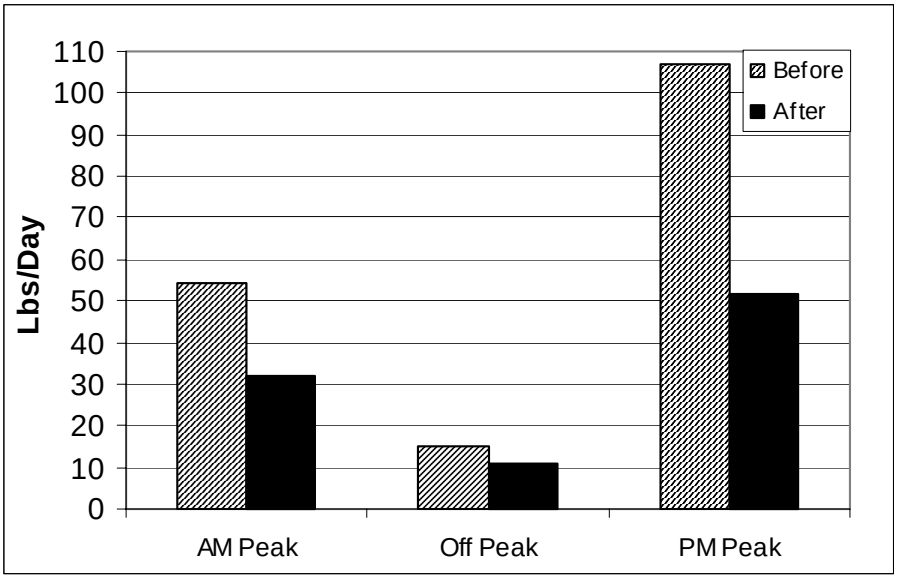
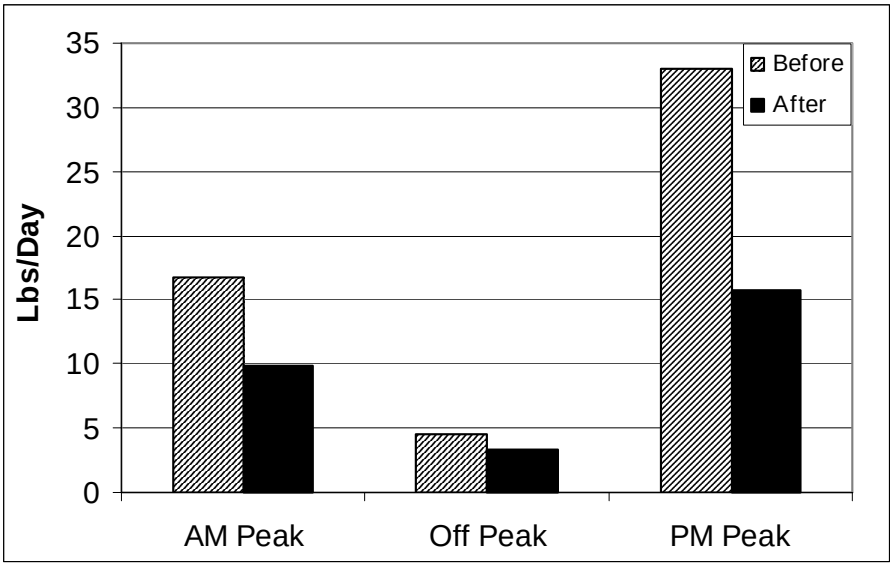


Figure K-10. Idling NOx Emissions before and after New Timing Cycle Implementation for the Rittiman System



Jones-Maltsberger Emission Reduction

Minimal emission reduction was evident once the recommended timing cycles were modeled for the Jones Maltsberger traffic signal system (Table K-36). The AM peak period had a VOC emission reduction of 0.6 pounds per hour and a NOx emission reduction of 0.2 pounds per hour. An emission reduction of 3 pounds per hour in VOC emissions and 0.8 pounds per hour in NOx emissions was noted for their PM peak period. The off peak period had an emission reduction of 0.3 pounds per hour of VOC emissions and 0.1 pounds per hour of NOx emissions. Figures K-11 and K-12 shows the emissions reductions by time period in bar graph format.

Table K-36. Idling VOC and NOx Emissions for the Jones Maltsberger Traffic Signal System, lbs/day

Time Period	VOC		NOx		Percent Change (VOC&NOx)
	Before	After	Before	After	
AM Peak	6.36	5.12	1.96	1.58	-19.52%
Off Peak	19.26	17.37	5.93	5.35	-9.86%
PM Peak	19.07	13.57	5.87	4.18	-28.85%
Total	44.69	36.05	13.76	11.10	-19.34%

Figure K-11. Idling VOC Emissions before and after New Timing Cycle Implementation on the Jones Maltsberger System

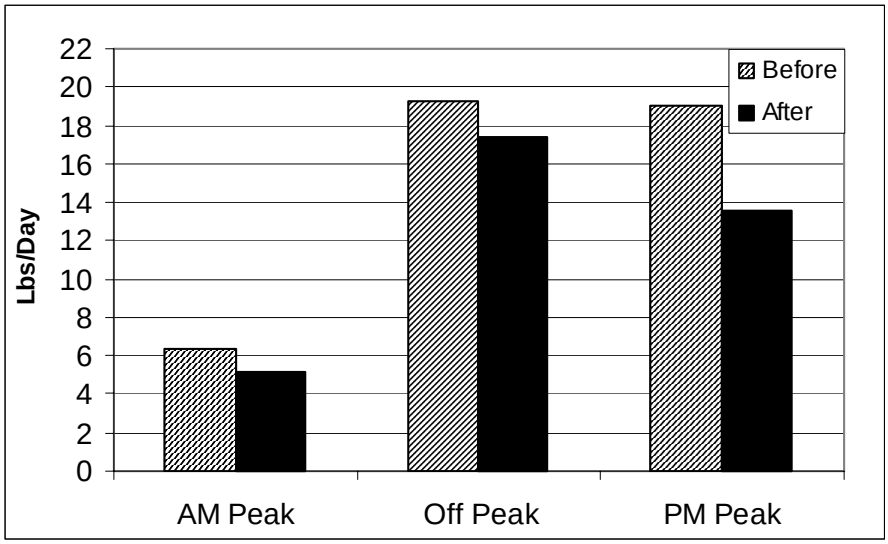
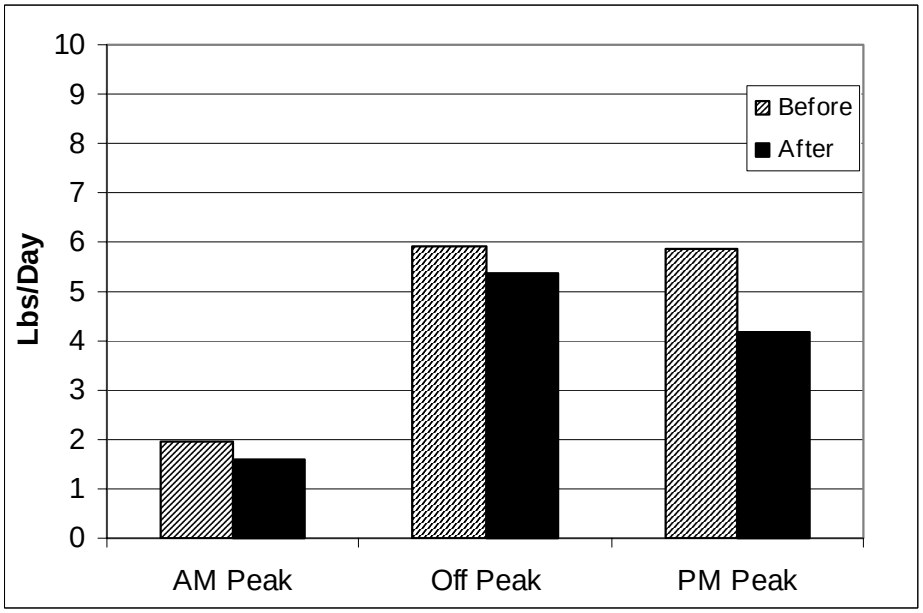


Figure K-12. Idling NOx Emissions before and after New Timing Cycle Implementation on the Jones Maltsberger System



Nacogdoches/Perrin Beitel Emission Reduction

The new timing cycles for the Nacogdoches/Perrin Beitel traffic signal system provided small emission reductions as well. The most emission reduction was noted in VOC emissions during the PM peak period, which amounted to two pounds per hour. The AM peak had an emission reduction of 0.6 pounds per hour and the off peak period had an emission reduction of 0.3 pounds per hour. Reductions in NOx emissions were small in

all three periods, the AM peak period having a reduction of 0.15 pounds per hour, off peak had a reduction of 0.09 pounds per hour and the PM peak having a reduction of 0.5 pounds per hour.

This system had the lowest percentage reduction in emissions with only an overall reduction on 5 percent. Also, table K-37 show that this intersection had the second lowest reduction in overall emissions with (7 lbs for NOx and 2 lbs for VOC). The results are also displayed in figures K-13 and K-14.

Table K-37. Idling VOC and NOx Emissions for the Nacogdoches/Perrin Beitel Traffic Signal System, lbs/day

Time Period	VOC		NOx		Percent Change (VOC&NOx)
	Before	After	Before	After	
AM Peak	11.69	10.41	3.60	3.20	-10.95%
Off Peak	44.23	42.57	13.62	13.12	-3.68%
PM Peak	92.21	88.37	28.39	27.21	-4.16%
Total	148.12	141.35	45.61	43.53	-4.55%

Figure K-13. Idling VOC Emissions before and after New Timing Cycle Implementation on the Nacogdoches/Perrin Beitel System

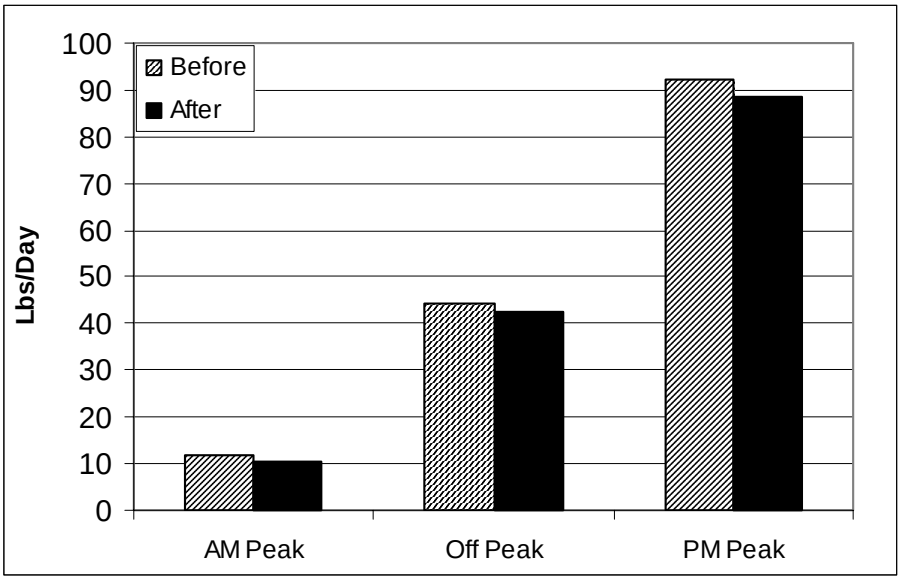
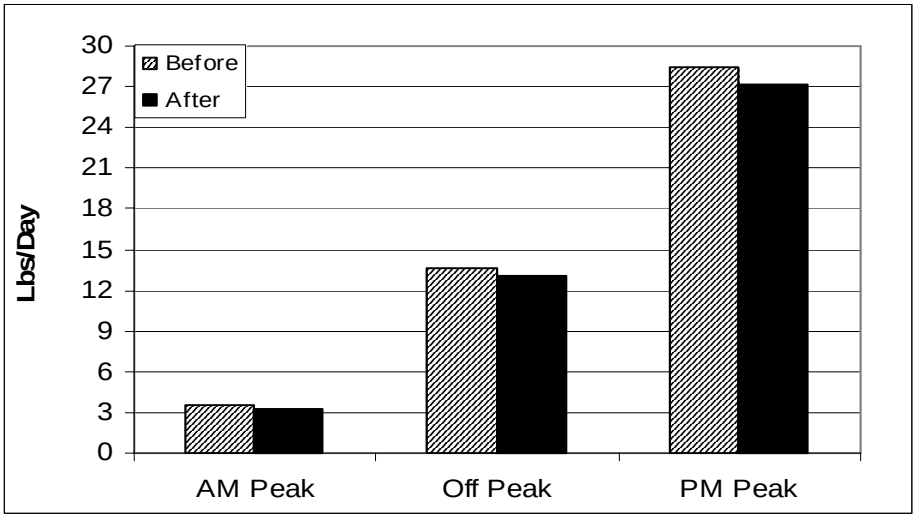


Figure K-14. Idling NOx Emissions before and after New Timing Signal Implementation for the Nacogdoches/Perrin Beitel System



The overall reduction of emissions over the selected time frame is illustrated in Figure K-8-15. There was a higher incidence of reduction in VOC emissions than in NOx emissions, however, for both precursors the highest reduction was noted in the PM peak hours followed by the AM peak hours. The figure graphically depicts the first modeling day for an example of the time curve. The graph shows that the PM peak emissions reductions were significant, while morning peak hour reductions were not as high as expected. The same trend was noted during all the days analyzed in the photochemical model.

Conclusion

Several steps were utilized to analyze selected traffic signal systems to estimate the emission reduction due to the improved timing cycles. Preliminary evaluation of the traffic signal systems Pape-Dawson Engineers, Inc involved data collection, design improvements, optimal timing plan development and implementation, and simulation of before and after conditions. Several models, the TRANSYT-7F, Synchro 3.2, and PASSER II, were used in the evaluation and assessment of the traffic signal systems. These models provided simulation files, “before” traffic flow simulations, and optimal timing cycles for the traffic signal systems.

Analysis of the recommended timing cycles for the various traffic signal systems indicated a reduction of ozone precursors if the cycles were implemented. The highest reduction was noted in the PM peak hours, followed by the AM peak hours, and then off peak had a consistent yet small reduction in VOC and NOx emissions.
The amount of the emission reduction was not a substantial amount to cause a notable and significant reduction in ozone levels. This could be due to the fact that approximately seven intersections were involved in the study rather than several dozen to several hundred. If more systems had been involved with the study then it is possible that a great amount of reduced emissions could equivocate to a greater reduction in ozone levels.

Also, since most of the ozone reduction occurred during the PM Peak Hours, the reductions had minimal impact on ozone levels. For the San Antonio area, On Road emissions impact ozone levels the greatest during the late morning and lunch periods, while late afternoon on-road emissions have a minimal impact on ozone levels[14].

[14] For a further description please see San Antonio-Bexar County MPO, June 2002, "UPWP 3.12: Photochemical Analysis of Transportation Control Measures and Alternative Fuel Vehicle Fleets", San Antonio, Texas.

ENERGY EFFICIENCY / RENEWABLE ENERGY PROJECTS

On December 13, 2002, the TCEQ revised the Houston-Galveston (HGA) SIP to include a protocol for implementing and calculating reductions from energy savings resulting from state Senate Bill 5 and Senate Bill 7 measures. This revision was followed by a revision to the Dallas-Fort Worth (DFW) SIP on March 5, 2003, which included an estimate of NOx reductions associated with SB5 and SB7. (Source: EEIRE)

Since that time, efforts have been underway both to implement the energy reductions required by the state and to quantify the associated ozone precursor reductions. Air quality planners in the San Antonio region currently benefit from a partnership created by the TCEQ between AACOG, the Energy Systems Laboratory (ESL) of Texas A&M University, the local Metropolitan Partnership for Energy, and the Brooks Energy Sustainability Laboratory (BESL) of the Texas Engineering Experiment Station.

ESL is charged by the state to assist local entities subject to Energy Efficiency mandates with these reduction quantification estimates. Under a recently-signed Memorandum of Agreement, BESL is to assist the ESL with technical assistance as part of its duties under Senate Bill 5 by producing an inventory of energy use and savings from existing and planned (through 2007) energy efficiency and renewable energy (EE/RE) projects. The Metropolitan Partnership for Energy (MPE) is assisting these other entities in the identification and inventory of existing and planned EE/RE using its reasonable best efforts.

The TCEQ guidance, "Incorporating Energy Efficiency and Renewable Energy (EEIRE) Projects in the SIP" is being used to provide specific guidance to BESL on content and reporting requirements, including requirements for a spreadsheet to facilitate conversion into creditable NOx reductions by the ESL.

The inventory is due to contain EE/RE project data from local, State, Federal and major private sector companies such as USAA and Toyota.

Types of projects will include, but not be limited to:
1. State-mandated IECC building codes and above code construction as well as special rating programs such as Build San Antonio Green and LEED ratings;
2. Local distributed energy projects including PV, solar-thennal, and fuel cells; renewable energy projects from remote locations planned;
3. Local government energy improvement projects including water and wastewater, street lighting and traffic signals;
4. Major energy conservation retrofits for existing facilities including Continuous Commissioning®, major equipment and control upgrades, and cool roofs, etc.

Deliverables will include:
a) Development of inventory of creditable local area SIP EE/RE projects.
b) Final report in spread sheet format of existing and planned energy efficiency projects by category, level of energy savings or clean energy from renewable energy projects.

Although credit is not taken here for the Energy Efficiency / Renewable Energy Projects in the region, the benefits of the reductions accrue as Additional Evidence that the San Antonio region will reach attainment. With the completion of the work accomplished

through this partnership, the San Antonio regional air quality planners will include the SIP credit available.

According to the very first draft efforts of the BESL/ESL/TCEQ/MPE/AACOG team, Energy Efficiency measures under Senate Bill 5 give the following reductions in energy production, in megawatt-hours per year (MWH/year):

- For Bexar County, the electricity savings are 18.179 MWH/year.
- For Guadalupe County, the electricity savings are 1.217 MWH/year.

With further research, these energy reductions will be quantified and precursor reductions located, as given in the outline above.

Executive Order 13123: Greening the Government Through Efficient Energy Management

Executive Order 13123 calls for Federal agencies to improve the energy efficiency of their buildings, promote the use of renewable energy, and reduce greenhouse gas emissions associated with energy use in their buildings, among other energy-related requirements. AACOG is working with several state sponsors to petition the federal government for emissions reductions credits for energy reductions in federal buildings. San Antonio has a high concentration of federal buildings subject to EO 13123. Just as credit for energy efficiency is afforded by state rules in Texas, credit should be available for energy efficiency measures installed in local federal buildings, as appropriate.

References:

"Incorporating Energy Efficiency and Renewable Energy (EEIRE) Projects in the SIP," February 5, 2004, Texas Commission on Environmental Quality, Austin, Texas

Federal Register Publication of Executive Order 13123 - Greening the Government Through Efficient Energy Management; published June 8, 1999. Online: http://www.eere.energy.gov/femp/pdfs/eo13123.pdf

PUBLIC EDUCATION

Introduction

The following pages describe the public outreach and education projects undertaken by AACOG staff for the purpose of disseminating information on air quality and informing the public of seriousness of air pollution problem in the San Antonio area. The main goal is to familiarize the public with actions they can take to improve the air quality.

Public Education to Encourage Voluntary Pollution Reduction Measures

The Air Improvement Resources Committee (AIR Co) has always recognized and will continue to recognize that public education is crucial to achieving long-term air quality improvement. Shortly after its formation, AIR Co created a Public Education subcommittee, comprised of public outreach specialists from local governments, utilities, and non-profits and chaired by AACOG staff, to oversee public outreach and education efforts.

The main goals of the Public Education committee are two fold; 1) to educate the public on the health risks posed by ozone pollution and how they can protect themselves, and 2) to encourage the public to take voluntary action to reduce ozone pollution. The primary method of basic ozone pollution and health education is the Air Quality Health Alert (AQHA) notification system and associated publicity and outreach efforts. The main voluntary pollution reduction measures advocated through publicity, paid media and presentations are:
Maintain your vehicle. (basic car care)
Drive less. (Commute Solutions, combining errands, walking and bicycling)
Don't idle. (Adopt-A-School Bus No-Idle Program)
Re-fuel in the evening.
Don't "top off".
To achieve its goals, the Public Education committee makes full use of advertising funds made available through grants from the Texas Commission on Environmental Quality, the Texas Department of Transportation, and, when available, the Environmental Protection Agency. In addition, AACOG staff makes significant efforts to obtain free publicity for air quality issues. Public education and outreach efforts, including paid advertising, publicity and other voluntary measures campaigns are summarized in the following paragraphs.

Air Quality Health Alert Notification System

AACOG provides and will continue to provide free AQHA notification for citizens, organizations, and companies within the region. The AQHA system informs citizens of TCEQ's forecast of high ozone pollution levels on a given day through emails and faxes distributed the afternoon prior to that day. The faxes not only advise recipients of the high ozone pollution forecast and advocate health protection, but also suggest voluntary measures that citizens can make year-round to help reduce ozone pollution. AACOG actively promotes this free service and has more than doubled the number of recipients in the last two years. As of March 2004, the number of registered recipients of AQHA notifications was approximately 1,000, many of whom spread the email to their entire organization, increasing the number of recipients to several thousand.

AQHA notifications are also provided to major media outlets and AACOG maintains relationships with those outlets to ensure that Alerts are broadcast with local news and

weather. In the near future, AACOG hopes to increase pressure on local media outlets to provide a daily Air Quality Index (AQI) report in addition to AQHAs. Past efforts have already resulted in daily AQI reports from two outlets, News 9 San Antonio (cable television news) and the San Antonio Express-News (primary metropolitan newspaper). As a part of actively promoting the AQHA notification system, AACOG staff routinely presents air quality and health issues to local community groups, businesses and students of all ages. Information on regional clean air policy and voluntary pollution reduction measures is and will continue to be included as a part of these presentations.

Paid Advertising

Paid advertising campaigns are broadcast on various local radio and television stations, in local newspapers, on highway billboards, and on Internet "hub" websites. Messages used promote clean air actions such as vehicle maintenance, fueling in the evening, and driving less by carpooling, combining errands, or using mass transit. A summary of paid media campaigns for 2001, 2002, and 2003 is available upon request as an example of standard advertising campaigns undertaken by this program. In general, the program advertises using radio "traffic" advertisements because they reach individuals where they are most susceptible to messages about alternate commuting, vehicle maintenance, and cleaner air: while they sit in their vehicles in traffic. The program also uses limited television advertising to convey both air quality and Commute Solutions promotion messages and, additionally, uses newspaper to advertise special events, such as the annual Ozone Season Kickoff event, which is described in later sections. The paid advertising budget is provided through the Alamo Area Commute Solutions grant funds from the Texas Department of Transportation. Advertising Commute Solutions transportation alternatives and their relation to improved air quality has been a major task in the Commute Solutions grant work plan for over five years and will continue to be as long as AACOG is the recipient of those grant funds.

Publicity

AACOG staff regularly issue news briefs, news releases, and Air Quality Health Alerts to local media in order to obtain coverage of air quality issues and events. Media coverage for 2001-2003, provided to show the continually increasing effort and result of AACOG staff work, is summarized in the table below:

Table K-38. Media coverage for 2001-2003

Media Coverage	2001	2002	2003	2004 Goals
Television Pieces	10	32	34	50
Radio Pieces	9	32	37	50
Print News Pieces	16	38	70	100

In 2003 alone, AACOG issued over 40 news items. AACOG staff will continue to issue news items and plans to increase the number of items issued each year.

Outreach Events & Presentations

AACOG staff also hosts and/or participates in community events, gives presentations to civic groups, and gives interactive lessons to student groups. As an example of the region's continuing commitment to educating individuals on a personal or small group basis, events, presentations, and interactive lessons given in the past three years are summarized below:

Table K-39. Outreach Activities

Outreach Type	2001	2002	2003	2004 Goals
Civic Group Presentations	27	23	34	50
School-Related Presentations	12	9	20	25
Events	18	19	27	40

At each of these outreach events or presentations, staff disseminates informational and promotional items to remind the public of ozone pollution's health effects and encourage individual voluntary pollution reduction measures. Materials are produced by AACOG through the Commute Solutions budget and are also donated to AACOG by various state and federal agencies, including the Texas Department of Transportation, the Texas Commission on Environmental Quality and the Environmental Protection agency. An example of this materials dissemination lies in the first eight weeks of 2004, in which staff has distributed over 4,000 items and reached over 1,600 individuals.

Website

In addition to external outreach efforts, AACOG staff maintains an air quality website, www.aacog.com/air, that provides extensive information on ozone pollution, its causes, its health effects, and voluntary measures citizens can take to help reduce the pollution problem. The website is constantly updated and expanded, providing weekly air quality facts and the latest news on air pollution and policy issues. Beyond just providing information, the website allows users to make requests of staff, including online registration for the AQHA program, informational and promotional materials requests and requests for air quality presentations for students or organizations.

Alamo Area Commute Solutions Program

The Alamo Area Commute Solutions Program, funded by the Texas Department of Transportation, seeks to reduce traffic and air pollution by promoting commute alternatives, including:

RideShare (carpooling and vanpooling)
Alternate Schedule (compressed work week and flex scheduling)
Mass Transit
Telework
Bicycling and Walking

The Commute Solutions Program has experienced great success in the past by targeting not only individual commuters with radio and television outreach, but by approaching businesses to institute Commute Solutions programs as benefits for their employees. Over 4,000 individuals currently participate in the Commute Solutions program. Commute Solutions will continue to increase success by further targeting outreach to companies through the Best Workplaces for Commuters program. As this program allows employers to receive substantial tax savings and improved public image by meeting a national standard of excellence in commuter benefits, it is a much improved tool for encouraging and actually achieving a reduction in single occupancy vehicle travel and, hence, air pollution.

In addition, Commute Solutions promotes and assists with the implementation of two commute assistance programs for schools, SchoolPool and Walking School Bus. By

reaching out to parents and schools through Parent Teacher Association meetings, mailings, and contact with administrators, Commute Solutions staff establishes and maintains School Pool and Walking School Bus programs that allow parents to share the responsibilities of driving or chaperoning a group of walking children on the way to and from school. This reduces the number of cars idling in the school's student pick-up/drop-off zone, which directly reduces pollution and also improves safety by reducing potential student-vehicle interaction in the parking lot.

All Commute Solutions services are available through the Commute Solutions website, www.aacog.com/commutesolutions, which is constantly updated and expanded. This website will be maintained throughout the coming years and will be used to provide ever quicker, more responsive, more accurate services to the region's commuters.

Adopt-A-School Bus Idling Reduction Program

Through the Adopt-A-School Bus grant, AACOG is embarking upon a new air quality outreach campaign focused on idling reduction. The No Idle program will educate students, parents, teachers and administrators on the air quality improvements possible through reduced idling, both by buses and passenger vehicles, during student drop-off and pick-up. The program will encourage drivers to "Clean it up. Turn it off. Keep it Green." by turning off their passenger vehicle engines when the vehicle will remain idle for more than ten seconds. Similar idling limits will be sought of bus drivers.

The main methods for this outreach will be personal contact and presentations to students, parents, school staff, and bus drivers. Students will participate as a "Green Patrol", tracking and rewarding drivers who are not idling. Parents and bus drivers will take the "No Idle Pledge." Schools will become certified "No Idle Zones."

Though schools will be the first focus of this program, once success is achieved at the schools, the program will be expanded to encourage reduced idling while waiting in parking lots and drive-through lanes.

A projected replacement of 275 school buses for the San Antonio area over the course of three school fiscal years could realize a reduction of approximately 110 tons/year of NO_x and 11 tons/year of PM. There would be an added benefit of a substantial reduction in the emissions of air toxins as well. There could be a combination of replacement and retrofitting of buses to achieve NO_x and PM reductions, depending on technology available and the availability of low-sulfur fuel.

LAWNMOWER RECYCLING PROGRAM

Introduction

Lawnmowers, rotary tillers, lawn and garden tractors, leaf blower/vacuums, and chainsaws are examples of this residential equipment category. When aggregated, residential equipment represents a major source of emissions that contribute to the pollution of air. There are ongoing efforts, with a degree of success, in the San Antonio area to mitigate pollution generated by residential lawn and garden equipment. In the following pages these efforts and attributed emissions benefits are discussed.

Calculating Emission Factors

An essential part of calculating residential equipment emissions is the use of an accurate emission factor (EF) for each pollutant. In the process of 1999 emission inventory, AACOG staff developed techniques for calculating residential equipment EFs, which have been documented in a report entitled " *1999 Emissions Inventory for the Alamo Area Council of Governments Region, August 2001*." These EFs will be used here to calculate the amount of emission reduction due to the CPS's "Mow Down Smog" lawnmower recycling initiative. The followings, taken from the above mentioned report, will describe this calculation procedure in more detail.

"In an effort to find more recent and specific equipment type EFs, EPA's recently updated (April 2000) Nonroad Emission Inventory Model was used.[15] The EFs for residential equipment were developed using the following process:[16]

A 1999 Nonroad Model run for residential equipment was done for Texas.
The output from this run was used to obtain the following for all types of residential equipment:
HC, CO (i.e., a colorless, odorless and tasteless gas released primarily by incomplete combustion of fossil fuels) and NO_x (i.e., a group of gases released by the combustion of fossil fuels and natural sources such as forest fires, lightning and decaying vegetation) emissions in tons/year for each type of equipment
Equipment populations (Eqmt. Pop) for each type of equipment
The Nonroad Model input file activity.dat, was then used to obtain the following values:
The activity rate of each type of equipment in hrs/yr. (HRS)
A LF (the average power level at which the engine operates divided by the maximum available power) for each type of equipment
The average horsepower (Avg. hp) for each type of equipment was then determined from the Nonroad Model input file Tx.pop.
With all the factors in place, EFs for HC, CO, and NO_x were then calculated using the following formula:

EF (g/bhp-hr) = (tons/year of pollutant) x (2000 lbs./ton) x (453.6 g/lb.)/ (Eqmt. Pop) x hrs/yr.) x (Avg. Hp) x (LF)

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[15] U.S. Environmental Protection Agency, 1992. Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources. Research Triangle Park, NC., and U.S. Environmental Protection Agency, 1991. Nonroad Engine and Vehicle Emissions Study Report. Washington, DC.

[16] U.S. Environmental Protection Agency, 2000. Nonroad Emission Inventory Model. Ann Arbor, MI.

The resulting EFs are used in calculating emissions from each type of equipment."

For reference, the following tables, which describe the residential equipment parameters and the calculated EFs for the residential equipment, reported in the above mentioned 1999 EI, are presented in this appendix:

Table K-40: Residential Equipment

Residential Equipment Parameters		
Equipment Type and Category	Average Horsepower (HP)	Load Factor (LF)
RT/R/2S	2.321	0.4
RT/C/2S	2.321	0.4
CS/R/2S	2.110	0.7
CS/C/2S	3.532	0.7
LV/R/2S	1.363	0.94
LV/C/2S	1.956	0.94
LM/R/4S	4.070	0.33
LM/C/4S	4.070	0.33
RT/R/4S	4.712	0.4
RT/C/4S	4.712	0.4
LV/R/4S	3.420	0.94
LV/C/CS	10.924	0.94
RERM/R/4S	10.657	0.38
RERM/C/4S	10.657	0.38
FM/C/4S	13.519	0.65
OLGE/R/4S	5.356	0.58
OLGE/C/4S	5.387	0.58

Table K-41: Emissions Factors

Calculated EFs for Residential Equipment (grams/hp-hr)							
Equipment Type	VOC					CO Exhaust	NOx Exhaust
	Exhaust	Crank	Diurnal	Displ.	Spillage		
LM/R/4S	52.0869	2.0697	3.3551	0.8595	7.2977	658.3792	2.7479

The next step in our calculation process entails estimation of length of time that a typical lawnmower is used in San Antonio area. By applying the EFs for NOx and VOC emissions to this length of time, the amount of emissions generated by a typical residential lawnmower can be calculated.

Lawnmower Usage Time

This length of time, according to the 1999 EI report, is 35.9872 hours per a year for Bexar County, which is the assumed area of interest for this calculation and the CPS's "Mow Down Smog" recycling program. Table K-42 illustrates how this usage time has been calculated.

Table K-42: Adjusted Lawnmower Usage Time

How many hours per summer week is the gasoline powered lawnmower used?					Lawnmower Use Ratio	Use (hr/yr.)
Choice (minutes per week)	Survey Response	Survey Response Ratio	Adjusted Survey Response	Adjusted Survey Response Ratio		
None	14	0.0388	0	0.0000	0.8643	0.0000
0-15	11	0.0305	11	0.0353		0.1234
15-30	24	0.0665	24	0.0769		0.8077
30-45	50	0.1385	50	0.1603		2.8045
45-60	75	0.2078	75	0.2404		5.8894
60-90	48	0.1330	48	0.1538		5.3846
90-120	25	0.0693	25	0.0801		3.9263
120-150	30	0.0831	30	0.0962		6.0577
>150	49	0.1357	49	0.1571		10.9936
Don't know	35	0.0970	0	0.0000	Total Use	35.9872
Total	361	1.0000	361	1.0000		

Emissions Reductions Amounts

The next step is to calculate the emission reduction amount (pound/day) due to the recycling of 4-cycle residential lawnmowers for emissions of VOC (exhaust, crank, diurnal, displacement, and spillage), CO exhaust, and NOx exhaust categories in Bear County. This process entailed use of EFs from Table K- 42 for LM/R/4S equipment and the following formula from 1999 EI report.

Emissions for VOC, NOx, and CO = EP x HRS x HP x LF x EF

Where:

EP = equipment population
HRS = annual hours of use
HP = average rated horsepower
LF = typical load factor
EF = average emissions of pollutant per unit of use

Table K-43 illustrates the results of this calculation for all VOC, CO, and NOx categories in Bexar County.

Table K-43: Reduced Emissions from “Mow Down Smog” Recycling Program

2003 Emission Reduction due to City Public Service "Mow Down Smog" Program *pound per ozone season day**						
Emission	Exhuast	Crank	Diurnal	Displ.	Spillage	Total
VOC	90.62	3.60	5.84	1.50	12.70	114.24
NOx	4.78					4.78
CO	1145.39					1145.39

**Ozone season in 1999 EI report consists 196 days*

TRUCKSTOP ANTI-IDLING PROGRAM

IdleAire provides individual electrical service for 53 parking spaces at the TransAmerica Truck Stop the intersection of Foster Road and IH-10 East. This has traditionally been referred to as “truck stop electrification (TSE).” On top of TSE, IdleAire provides other layers of services that comprise Advanced Travel Center Electrification (ATE), a flexible package that can be altered and customized to industry needs. Currently, a heating, cooling and ventilation unit sits above each parking space. The unit is connected to the Service Delivery Module by means of a flexible, reinforced, concentric hose, which also houses the delivery mechanisms for the communications and entertainment packages. All TSE and ATE services, including temperature, fan speed and all other service selections, are delivered to and independently controlled by each individual driver in the truck cab via the Service Delivery Module.

The IdleAire system *removes 100% of emissions associated with extended diesel idling,* including nitrogen oxides (NOx), particulate matter (PM), volatile organic compounds (VOC), carbon monoxide (CO) and carbon dioxide (CO2). The system has a net reduction of 98% of criteria pollutants under the Clean Air Act after accounting for the electricity from the grid used to power the system, and an overall 83% net emissions reduction. *Per each parking spaces each year (assuming 60% utilization)*, those diesel emissions amount to an estimated .71 metric tons of NOx, .014 tons of PM, .036 tons of VOC, 54.65 tons of CO2, and .30 tons of CO totaling 55.71 metric tons a year. Applied to the 53 parking spaces at this facility, those emissions would amount to about 2952.63 tons each year. The IdleAire system saves 100% of the diesel fuel associated with extended diesel idling, approximately 1.0 to 1.1 gallons per hour.

WALKING SCHOOL BUS PROGRAMS

Walking School Bus programs help provide a safe and healthy way for young students to travel to and from school while also decreasing vehicle-related pollution, increasing child activity, and relieving parents of extra morning stress. Currently, many students who live to near to school to ride the bus are driven to and from school by their parents. Both the additional vehicle miles traveled and vehicle time spent idling due to parental drop-off and pick-up are sources of air pollution. Walking School Bus matches parents of non-bus riding students who live near one another and attend the same school. The matched parents are then advised to set up a schedule by which they divide chaperoning duties for a small group of students on their walk to school. Parental supervision increases the safety of the student walkers and thus eases parent fears about allowing their children to walk rather than be driven. Walking to school provides the students with healthy daily activity, and, with fewer vehicles making the home-to-school commute air pollution and parental stress are significantly reduced.

Lower Reid Vapor Pressure

Fuel control measures are effective strategies for states to use to reduce ozone pollution. The two primary approaches to fuel controls are state opt-in to the federal RFG program subject to certain conditions, and state adoption of a low Reid Vapor Pressure (RVP) requirement that is more stringent than the applicable federal RVP requirement. While both approaches reduce volatile organic compounds, which are precursors to ozone, they differ in their overall environmental benefits, whether the state or federal government administers them, and the statutory provisions governing their adoption.

About Credits for Lower RVP Under an Early Action Compact

In general, the Clean Air Act (CAA) provides that states are preempted from adopting their own fuel control requirements different from existing federal requirements. However, EPA may waive preemption under certain circumstances.

State opt-in to the RFG program is not preempted because EPA establishes and enforces the federal RFG requirements at the federal level and the Act provides explicit authority for states to opt-in to the federal requirements under section 211(k).

State adoption of low RVP gasoline requirements is controlled by section 211(c)(4) of the CAA. Section 211(c)(4)(A) prohibits[17] states from prescribing or attempting to enforce any "control or prohibition" of a "characteristic or component of a fuel or fuel additive" if EPA has promulgated a control or prohibition applicable to such characteristic or component under section 211(c)(1). This preemption does not apply if the state control is identical to the federal control. Section 211(c)(4)(C) provides an exception to this prohibition for a non-identical state standard contained in a state SIP where the standard is "necessary to achieve" the primary or secondary NAAQS that the SIP implements. EPA can approve such a state SIP provision as necessary if the Administrator finds that "no other measures that would bring about timely attainment exist," or that "other measures exist and are technically possible to implement, but are unreasonable or impracticable."

The 7.2 psi gasoline RVP of for the San Antonio region was proposed after undertaking careful and in depth modeling, cost-benefit analysis, and consideration of sentiments of the local communities and their elected officials. The local refineries have also been contacted to determine their ability to produce and market this fuel with considerable competition among each other. It was determined that the refiners were technologically capable of producing the proposed gasoline fuel and the market forces would drive the at-pump price.

If allowed, adoption of this fuel during the ozone season is expected to help reduce emissions of VOCs and NOx by 2.1 and 0.05 tons/day respectively. The requirement for gasoline refineries to provide such gasoline will only be during the months of March through October, which is usually the time of the year ozone levels exceed the national standard in San Antonio region. Currently, the State's Regional Low RVP Gasoline

[17] Federal Clean Air Act, Sec. 211. (a)(4)(A) "Except as otherwise provided in subparagraph (B) or (C), no State (or political subdivision thereof) may prescribe or attempt to enforce, for the purposes of motor vehicle emission control, any control or prohibition respecting any characteristic or component of a fuel or fuel additive in a motor vehicle or motor vehicle engine." Available online as http://www.epa.gov/oar/caa/caa211.txt.

program requires that low RVP gasoline be used in 95 central and eastern Texas counties during the summer months when ozone pollution is at its worst. The program, which began May 1, 2000, requires that all gasoline sold from retail gasoline-dispensing facilities within the affected counties have a maximum Reid vapor pressure of 7.8 psi from June 1 through October 1 of each year. Gasoline suppliers are required to supply low RVP gasoline to the affected counties from May 1 through October 1 of each year.

Credit Calculations
Adoption of 7.2 psi fuel during the ozone season is expected to help reduce emissions of VOCs and NOx by 2.1 and 0.05 tons/day respectively. The requirement for gasoline refineries to provide such gasoline will only be during the months of March through October, which is usually the time of the year ozone levels exceed the national standard in San Antonio region.

Reduction Calculations Methodology Overview
Modeling scenarios with the MOBILE6 model indicated that lowering the RVP in gasoline to 7.2 from 7.8 would reduce emissions from the on-road mobile fleet in the SAER counties. The table below lists the emission reduction percentages for each of the SAER counties.

Reductions for SAER counties with RVP 7.2 gasoline, compared with RVP 7.8.

County	VOC % Reduction, 2007 On-Road Mobile Fleet	NOx % Reduction, 2007 On-Road Mobile Fleet
Bexar County	4.18	0.06
Comal County	3.73	0.05
Guadalupe County	3.69	0.05
Wilson County	3.14	0.06

The percentage reduction of precursor emissions was used to calculate actual reductions. The actual reduction was estimated by multiplying the 2007 daily on road emissions total for each county with the emission reduction percentage. The resulting number was then divided by 100 to provide the emission reduction total in tons per day.

(2007 tons/day VOC x emission reduction %) / 100 = 2007 tons/day of VOC reduced)

References:

Texas Commission on Environmental Quality (TCEQ), 2000. "Dallas/Fort Worth Attainment Demonstration." Available online: http://www.tnrcc.state.tx.us/oprd/rule_lib/4dfwsip.pdf